**FINAL REPORT**

# Distribution and Abundance of Western Gray Whales off the Northeastern Sakhalin Shelf July - September 2003: Vessel-Based Surveys

Prepared in accordance with the "Comprehensive Program for Study of the Okhotsk-Korean Population of Gray Whales and the Condition of their Feeding Grounds off the Northeastern Coast of Sakhalin Island, 2003-2007"

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**June 2004**

State Fisheries Committee
Russian Federation

Federal State Unitary Enterprise
Pacific Research Institute of Fishery and Oceanography
(FGUP TINRO-Center)

UDC 639.24.053.7:599.745

Inv. No. _____

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_____ 2004

RESEARCH PROGRAM ANNUAL REPORT

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Vladivostok – 2004

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**ACKNOWLEDGEMENTS**

We are especially grateful to boatswain A.F. Kholodnyakov, navigating officer Yu.V. Domrachev, and sailors D.A. Romanov and S.A. Kholodnyakov. We thank Sonya K. Meier and Stephen R. Johnson of LGL Limited environmental research associates, Rodger Melton of Exxon Mobil, and Lisanne Aerts of Sakhalin Energy Investment Company for their comments. This expedition was funded by Exxon Neftegas Limited (ENL) and Sakhalin Energy Investment Company Limited(SEIC).

## INTRODUCTION

Since the late 20th century the exploration and commercial development of gas- and oil-bearing resources have been actively pursued on the northeastern Sakhalin shelf. This activity makes it critically important to conduct multi-year monitoring of the marine ecosystem in this region in order to identify potential anthropogenic impacts. The potential for impacts is particularly acute for the extremely small Korean-Okhotsk (western) gray whale population, which is on the listed as endangered by the Russian Red Book and critically endangered by the IUCN. The known feeding area for these whales coincides with the area of commercial development of gas- and oil-bearing fields on the northeastern Sakhalin shelf. In light of this in recent years, various scientific organizations have been actively conducting research in the gray whales' feeding areas.

In the summer of 2003, as a continuation of this work, according to an agreement between VNIRO and TINRO (subject № 25-03), there was a scientific research voyage on the seagoing tugboat *Nevelskoy* (ship owner – NPO "Epron" LLC, Vladivostok). In addition to studying the species composition, distribution, and abundance of marine mammals on the northeastern Sakhalin shelf, the research vessel was a convenient base platform for conducting other aspects of marine mammal research and monitoring program, including photo-identification, prey and acoustic research. The expedition was funded by the oil companies Exxon Neftegas Limited (ENL) and Sakhalin Energy Investment Company Limited (SEIC).

## BACKGROUND

Most of the vessel-based surveys between 1997-2001 were conducted in association with the photo-identification work conducted by the US-Russian photo-id team (Würsig et al. 1999, 2000; Weller et al. 2000, 2001, 2002). However, in 1997, separate vessel-based surveys were conducted nearshore along the northeast coast of Sakhalin Island (Würsig et al. 1999). TINRO conducted surveys in the Sea of Okhotsk in early 1999 and vessel surveys were also conducted in support of the 2001 ENL Odoptu seismic exploration program (Meier et al. 2002). It was during the 2001 ENL seismic program that the Offshore feeding area was discovered (Maminov and Yakovlev 2002, Meier et al. 2002).

In 2002, (Perlov et al. 2003) trained observers documented gray whales and other marine mammals during both opportunistic and systematic vessel-based surveys that were conducted from the research ship, *Nevelskoy* in both the nearshore feeding area along Piltun lagoon and in the Offshore area. A systematic survey was conducted in the Offshore feeding area on 7 September 2002 and during this survey MMOs observed 21 sightings of 50 gray whales with group sizes ranging from one to seven whales. Nonsystematic observations throughout 2002 in this area indicated that the distribution of gray whales stretched from south-west to the northeast and was similar to the general distribution observed during a vessel survey in September 2001 (Meier et al. 2002). The distribution of whales in this area was uneven or "patchy" but almost half of gray whales observed were concentrated in a limited area ~15 square miles. Subsequent visits to this high-use area for prey sampling and whale photo-identification did not reveal any significant changes in the distribution of

whales, however in October for reasons unknown, the distribution appeared to shift slightly south within the feeding area.

In 2002, similar distribution shifts were observed in the nearshore feeding area along Piltun Bay. A systematic survey was conducted in the Piltun Bay feeding area on 7 September 2002 and during this survey MMOs observed 16 sightings of 28 gray whales with group sizes ranging from one to five whales. Throughout most of September, gray whales were observed relatively uniform along the coast, however by early October, whales were only observed in the northern part of the feeding area. A within-season shift in the distribution of gray whales in the nearshore feeding area along Piltun lagoon from south to north late in the season has been observed in previous years but is not considered a rule. In both feeding areas, whales were often observed "fluking" or exposing their tail when diving, usually indicating benthic feeding activity. In addition, whales were often observed with mud benthic feeding plumes.

## OBJECTIVES

The purpose of this study was to quantitatively characterize and monitor the temporal and spatial abundance, distribution, and activities of marine mammals, in particular, gray whales off northeast Sakhalin Island. The short-term (seasonal/annual) goals of the vessel-based gray whale counts are to provide an additional set of information (independent from the aerial surveys) of gray whales in the two known primary feeding areas (Piltun and Offshore) and in other areas where the vessel may be operating. The longer-term (multi-annual) goals of the vessel-based surveys are to provide the data on annual trends in distribution and abundance of western gray whales. Ultimately, this information will be useful to both marine mammal scientists and industry representatives when developing and assessing mitigation plans to protect the whales.

Specific objectives of the vessel-based surveys were as follows:

- Record all marine mammals with the particular focus on the endangered western gray whales.

- Complement the aerial surveys of the area, whose main objective is to characterize the local and regional distribution of gray whales off the coast of northeast Sakhalin Island.

- Study the number and distribution of gray whales throughout the season in two areas of concentration; one area located along the coast adjacent to Piltun Bay (N52°40' to N53°30'), and the other one located further offshore between N51°55´ and N52°25´ at depths of 35-60 m.

- Provide more direct data on the numbers of relatively densely distributed feeding gray whales. A slow moving vessel allows for sufficient time to accurately count whales.

- Provide details on behavioral observations (eg. feeding, traveling) of gray whales and other marine mammals.

## METHODS

In conjunction with the vessel-based prey sampling, photo-identification and acoustic monitoring programs, experienced marine mammal observers (MMOs) aboard the *Nevelskoy* conducted dedicated marine mammal surveys in both the Piltun and Offshore feeding areas. Members of the vessel crew also assisted with observations during surveys. The *Nevelskoy* conducted dedicated surveys of marine mammals both in the coastal Piltun feeding area (Table 1) and in the Offshore feeding area (Table 2). In the Piltun feeding area, a single transect line was surveyed along the coast from 52° 30`and 53° 30` N at a distance of 2-2.5 km from shore (Fig.1). In the Offshore feeding area dedicated surveys were conducted in an area bounded by the coordinated 143° 30` and 143° 54` E and latitudes 52° 25` and 51° 55` N, traveling along 10-11 east-to-west tracklines with an interval of 3.5 miles between tracklines (see Fig. 1). This is a modification from the survey lines from 2001 and 2002 that were oriented north-south (see Perlov et al. 2003). In addition, the vessel survey lines covered an area further east than previous vessel surveys in 2001 and 2002. The tracklines of the vessel throughout the expedition were recorded automatically by GPS. After 20 August, the GPS position of the *Nevelskoy* was recorded manually every half hour due to a computer malfunction.

In addition to the dedicated surveys that were conducted along predefined transects, the MMOs continuously observed and recorded western gray whales and other marine mammals during all daylight vessel activities (traveling, prey sampling, photo-identification, acoustic monitoring) (Appendix 1 and 2) from the moment the vessel left port in Vladivostok (22 July 2003) until its return (25 September 2003). It was also the MMOs' responsibility to advise the captain of the *Nevelskoy* to maintain a 1 km safety distance between the ship and observed gray whales while the ship was moving.

The MMOs conducted observations from the highest suitable observation point on the *Nevelskoy* and observations were conducted on both sides of the vessel. Observations were conducted from the pilot house or upper bridge during daylight hours, 7.5 and 10 m above the water, respectively. Observers used reticule binoculars to detect marine mammals at distances, resolve details during marine mammal sightings, and estimate ranges to marine mammals. Information on date and time, sightability, weather, species, vessel position and heading, and whale distance from the vessel and general behavior were recorded. A GPS was used to determine the exact location of the vessel. The animals' direction of motion relative to the boat was defined in terms of a clock face, assuming that 12 o'clock on the clock face corresponded to the vessel's own movement direction. The distance to the animals was determined the moment they were abreast of the boat. Information on sea state was given in points, and visibility conditions in kilometers. MMOs completed, proofread, and entered the daily datasheets into a laptop computer at the end of each day and data was backed up.

## RESULTS

From July to September 2003, the species composition of marine mammals recorded within the survey area consisted of seven species of cetaceans including the:

- western gray whale - *Eschrichtius robustus*,
- minke whale - *Balaenoptera acutorostrata*,
- killer whale – *Orcinus orca*,
- white whale– *Delphinapterus leucas*,
- harbor porpoise – *Phocoena phocoena*,
- Dall's porpoise – *Phocoenoides dalli*,
- Pacific white-sided dolphin – *Lagenorhynchus obliquidens*,

and five species of pinnipeds:

- northern fur seal – *Callorhinus ursinus*,
- northern sea lion – *Eumetopias jubatus*,
- ringed seal– *Pusa hispida*,
- largha seal– *Phoca largha*, and
- bearded seal– *Erignathus barbatus*.

### Effort

More than 700 hours were spent on the observations in all including dedicated surveys and opportunistic observations. During this time, a survey was made of the northeastern Sakhalin shelf, part of the Sea of Japan and Sea of Okhotsk water area, including the center of Sakhalin Bay, the ship channel of the Amursky estuary, and the shelf of the mainland part of the Tatar Straits (Fig. 2). Dedicated surveys were planned in both feeding areas at least 3-4 times during the summer field season. However, due to the persistent fog (which is typical of the northeastern Sakhalin shelf in the summer), the more frequent cyclones this year (on which eight days were lost while seeking shelter from the storms), the seven days by which the expedition was cut short (due to problems with the boat's engine), and the ambitious nature of the expedition program to begin with, the anticipated volume of survey work was not completed in the Offshore area (see Tables 1 and 2 and Appendix 2).

### Western Gray Whale

While traveling on the tugboat *Nevelskoy* from the Port of Vladivostok to the primary survey area along the northeast coast of Sakhalin Island, no gray whales were sighted in the Sea of Japan or the Sea of Okhotsk or near the Terpeniye Peninsula, where they had been sighted in 2002 (Perlov et al. 2003). Gray whales were only encountered regularly in the Offshore and Piltun feeding areas (see Fig. 3). All gray whale sightings observed during daylight hours, from dedicated surveys and from opportunistic observations are shown in Figure 3 and are broken down into periods in Figure 4a-f with the corresponding vessel tracklines.

*Piltun Feeding Area*

In late July to the first third of August, no dedicated surveys were conducted due to frequent fog in the Piltun feeding area. The number of observed gray whales in the Piltun feeding area from mid-August to mid-September during each dedicated vessel survey was 31-47 whales (see Table 1). These counts are dependent on effort and the number of gray whales present in the Piltun feeding area in mid-August are uncertain due to reduced observer effort of the area on 13 August and reduced survey effort on 15 August (Figs.5 & 6). On 13 August, 31 gray whales were observed, however gray whales in the northern half of the area were observed and recorded by one observer and this could have resulted in an under-count or missed whales.

On 25 August, two areas within the Piltun feeding area appeared to be occupied more than others by gray whales (Figs. 7 & 8) and this pattern continued until mid-September (see Figs. 7, 9, & 10). One such site was in the south, near the Piltun estuary between the coordinates 52° 48` – 52° 59` N. lat.; the other was in the northern part of this area inside the water area with coordinates 53° 12` – 53° 22` N. lat. Interestingly, during the dedicated vessel surveys conducted from 25 August - 12 September, some whales observed in the north end of the feeding area were located in water >20 m at distances up to 6 km from shore (see Figs. 8, 9 & 10). Whales were also observed up to 6 km from shore in the southern end of the feeding area near the mouth of Piltun lagoon. On 12 September, gray whales were observed along most of the survey route and whales did not appear to be aggregated in the north and south ends of the survey route (Fig. 11). Whales were present in these two areas during every survey, although their numbers fluctuated (see Fig. 7).

Toward the end of the middle of September (18-19 September) visibility was excellent, although the entire area was not surveyed (see Figs. 7 and Table 1). On 18 September, there were no gray whales over a substantial area north of the Piltun estuary between 52° 54' - 53° 06' N. lat., and the number of whales in the northern part of the feeding area was about the same as on previous days (24 whales) (Fig. 12). On 19 September during the first morning survey there were no gray whales in the southern half of the Piltun feeding area within visibility range to the north of the Piltun estuary (Fig. 7). Seven whales were sighted in the south, in an area bounded by the coordinates 52° 52` – 52° 42` N. lat. During the second afternoon survey of the southern half of the Piltun feeding area, this time headed north, twice as many gray whales were sighted in this region. It seemed that on this day the gray whales were changing their feeding locations, however it is unknown if whales moved into this region from the northern half of the Piltun feeding area, from the Offshore feeding area, or some other location.

Many sightings were observed 1.5 – 2.5 km from shore at depths of 10 – 14 m. Gray whales were encountered much more seldom further than 3 km from shore and this occurred primarily in the northern part of the feeding area late in the summer, however this was also observed in the southern end of the feeding area near the mouth of Piltun lagoon. In the southern end of the feeding area near the Piltun estuary, gray whales were regularly observed in direct proximity to the shore but were also observed up to 6 km from shore. Out of 268 gray whale sightings observed in the Piltun area during all vessel activities, 21 sightings were

observed in water greater than 20 m (see Fig. 3). The shore-based behavioral team also reported whales further offshore (up to ~10 km from shore) in the northern end of the Piltun area compared to the rest of the area (Gailey et al. 2004).

Calves were seen more than once in the Piltun feeding area, usually accompanied by 1-2 adult whales. Two instances were recorded when calves were observed alone. One calf was seen 25 August in the north of the area at coordinates 53° 19` N. lat. and 143° 14` E. long. Three calves were sighted on this day. In 2003, calves were seen most often near the Piltun estuary at the southern end of the Piltun feeding area.

*Offshore Feeding Area*

Dedicated vessel surveys in the Offshore feeding area were conducted 8 August, 14, August and 26 August (see Table 2). Unfortunately, persistent fog on 8 August made a detailed survey impossible, particularly in the northern part of the survey area (Fig.13). Overall, including sightings from dedicated surveys and opportunistic observations, the distribution of gray whales stretched from south-west to the north-east and whales were located in patches (see Fig.3). On 14 August, gray whales were concentrated in the southern part of the area, between coordinates 51° 58` – 52° 08` N, and their distribution was confined to the southern and western borders of the area (Fig. 14). The fog restricted coverage of the entire survey area on 26 August (Fig. 15).

The number of gray whales sighted in the Offshore feeding area fluctuated on different surveys (see Table 2). The greatest number was recorded on 14 August (48 whales). Almost half as many (28 whales) were seen on 8 August, however only 50% of the survey area was covered (see Fig. 13). The smallest number (23 whales) was recorded in the Offshore feeding area on 26 August. The low number of gray whales on this day was due to the fact that many gray whales were observed east of the defined survey area. For example, on 7 September along the vessel's route from 52° 08` N. lat. 143° 44` E. long. to 52° 16` N. lat. 143° 54` E. long., 25 gray whales were sighted (opportunistically during other expedition activities) which is more than were sighted over the entire Offshore feeding area on 26 August during a dedicated survey.

During opportunistic observations on 26-28 August, gray whales were observed to the northeast where they were concentrated in proximity to the eastern border of the defined survey area, in an area between coordinates 52° 06` – 52° 12` N. lat (see Fig. 4d). Some whales were seen even as far east as 143° 47` E. long. The vessel returned to the Offshore area on 5 September and prey sampling, photo-ID and acoustics monitoring was conducted from the vessel and gray whale sightings were recorded during these activities. During the first third of September gray whales were opportunistically observed within the vessel survey area and were also observed outside of the defined vessel survey area to the northeast in a water area bounded by the coordinates 52° 10` – 52° 16` N. lat., 143° 44` – 143° 54` E. long (see Fig. 4e). These whales were subsequently photo-identified and prey sampling was conducted in the area where whales were observed feeding.

*Group Size*

Gray whales were usually found alone (54.4%) or in pairs (33.3%) (Table 3). Large congregations of 6-7 whales did not remain together long and quickly split up into smaller groups. It was common to observe whales in such congregations moving in one direction for a period of time as they sometimes converged and sometimes dispersed themselves across the water area. Due to the amount of movement, sometimes a fairly long period of time would be required to determine the numerical composition of the groups, and in certain instances it could not be determined at all.

We did not find any significant differences in the group size of gray whales in the Piltun and Offshore feeding areas. An exception is the frequency of sightings of groups of three whales, whose absolute and relative indicators were 1.5 and 2 times greater, respectively, in the Offshore feeding area. It is interesting that single whales were encountered less often in August than in September in both areas, but particularly in the Offshore feeding area. Similar changes in the frequency of sightings of single gray whales during these months were also seen in prior years (Sobolevsky 2000, Blokhin et al. 2003), which suggests that there could be a trend behind these changes. However, additional, focused research studies using the same method and factoring in gray whales' behavioral characteristics are needed before any final conclusions can be made.

*Behavior*

Social behavior was also observed during the expedition. Groups of two to four individual gray whales were observed to swim close together, rolling over one another, often diving, showing above water small areas of their torso or the fans of their pectoral or tail fins. Social and sexual behavior was also observed in the Piltun area by the shore-based behavioral team in late August and early September 2003 (Gailey et al. 2004). Similar social sexual behavior has been observed in eastern gray whales on their feeding ground, however the purpose of the social activity is unknown (Jones and Swartz 2002 in Gailey et al. 2004).

*Interseasonal comparisons*

*Piltun Feeding Area*

Dedicated vessel surveys were conducted in 2001-2003 along the northeast coast of Sakhalin Island in the Piltun feeding area. Only one dedicated survey was conducted in 2002 on 7 September. In 2003, dedicated vessel-based surveys of gray whales were conducted in the Piltun feeding area, on similar dates as dedicated surveys conducted in 2001 (Table 4). Comparing the results of surveys from 2001-2003 indicates that the distribution and abundance of gray whales was similar between years in the Piltun area (Fig. 16). The maximum and average number of whales observed during dedicated surveys appeared higher in 2003 compared to 2001, however this could have been a result of differences in observer and survey effort and visibility (sea state, fog) between years. It is important to note that due to fog in 2003, the area surveyed opportunistically in 2003 was a bit farther south than in 2002 compared to 2003 (Fig. 16). In 2002, we reported that in late September, more whales were observed in the northern part of the study area compared to the southern part (Perlov et

al. 2003) and this pattern was also observed by the shore-based behavioral team in 2002 (Würsig et al. 2003). Reduced vessel survey effort in September in the north and south (see Fig. 7) does not allow us to assess within season distribution shifts late in the season in 2003. However, the shore-based behavioral team reported substantially more whales in the north part of the feeding area in 2003, however no seasonal trends were discussed (Gailey et al. 2004).

*Offshore Feeding Area*

The distribution of gray whales stretched from south-west to the north-east as was observed in 2001 (Maminov & Yakovlev 2002, Meier et al. 2002) and 2002 (Perlov et al. 2003). The distribution of whales within these boundaries were uneven and whales were aggregated in patches as observed in 2001 and 2002 (Maminov & Yakovlev 2002, Meier et al. 2002, Perlov et al. 2003). However, the distribution of gray whales in 2003 was observed farther east than in 2001 and 2002 and whales were observed outside the eastern borders of the survey area in waters greater than 50 m, and possibly remained there for several months more (see Table 5 and Fig. 16). Aerial surveys did not reveal significant gray whale congregations in the Offshore feeding area either in September 2003 or in the months that followed (Blokhin et al. 2004), however the aerial surveys did not cover areas over 50 m in depth and therefore would have not detected whales located further east. This was the first time in all the survey years that gray whales on the Sakhalin shelf had been observed so far east (143° 54` E. long.). It is important to note that it is possible that the orientation of the survey lines increased the detection probability of whales east of the defined survey area. In 2002, two survey lines were oriented north to south (see Perlov et al. 2003) but in 2003, 11 survey lines were oriented east to west (see Fig 1). It is possible that whales were present east of the defined survey area during the entire season and were undetected, however it is equally plausible that the distribution of whales shifted east in late August. It is also possible that whales were located in this area in 2002 but were undetected due to no aerial or vessel survey effort in waters greater than 50 m.

Similar numbers of gray whales were observed in the Offshore area in 2002 and 2003. During a dedicated survey in the Offshore feeding area on 14 August 2003, almost the exact same number of gray whales (n= 48) was sighted during a dedicated survey on 7 September 2002 (n=50) (Perlov et al. 2003). In 2001, the Offshore area was not discovered until late in the season and only two surveys were conducted in September. The number of whales counted during each of these two surveys were as high as 83, however it was likely that some whales were counted multiple times and the number was less than 83 individuals. Therefore, due to differences in observer/ survey effort and visibility (sea state, fog) between years it is difficult to directly compare the number of whales observed from 2001-2003.

**Minke Whale**

Minke whales were sighted in the Sea of Okhotsk and the Sea of Japan (Fig. 17, see Appendix 1) and were constantly sighted alone. On the northeastern Sakhalin shelf, minke whales were seen occasionally – seven days in August and four days in September. Usually one to two minke whales were seen in a day, and only on 7-8 August and 3-4 September, were four to eight minke whales sighted in a day. Minke whales were generally observed a

substantial distance from shore, between 143° 32` – 143° 40` E. long. Their presence on 7-8 August in the Offshore feeding area was probably associated with the presence of schools of herring (Sleptsov 1955). The minke whale was sighted a total of 29 times on the northeastern Sakhalin shelf in August and September 2003, with a total number of 31 whales. The frequency of sightings of minke whales has fluctuated widely in different years. However, in August 2001 the frequency of minke whale sightings was the highest for 2001-2003. In August 2001, minke whales were frequently observed with up to 14-17 whales sighted per day (Perlov et al. 2002).

**Killer Whale**

Killer whales were sighted throughout the study area with a total of 13 sightings of 41 whales were recorded (see Fig. 17, Appendix 1). The total number of these whales sighted was 33, of which three were in July, 19 in August, and 11 in the first half of September. The animals were seen both near to shore and in more offshore waters. Over the past three years there have been no significant changes in the number of the killer whales observed during vessel surveys.

The killer whale was also found more often in a group of three, and always with an adult male present (Table 6). Other groups of one to four killer whales were encountered with the same frequency. Only once was a group of eight killer whales encountered, in which there were four males. A group of two, probably adult females, was seen only once as well.

**White (Beluga) Whale**

Two groups of white whales were seen only once, on 22 September 2003, in the northernmost part of the Tatar Strait, near the mainland coast (see Fig. 17, Appendix 1). Two white whales were headed north, and a group of six was headed west.

**Harbor Porpoise and Other Small Dolphins**

In 2003, three species of small dolphins were sighted including two species of harbor porpoise and the Pacific white-sided dolphin (see Fig. 17, Appendix 1). The harbor porpoises, represented largely by the common harbor porpoise, were seen throughout the study area. On 24 July 2003, 49 Pacific white-sided dolphins were sighted in Aniva Bay, near the Laperouse Strait.

On the northeastern Sakhalin shelf, 80 common harbor porpoises and three Dall's porpoises were sighted. Small dolphins were observed 7-8 August in the Offshore feeding area. Compared to 2001-2002, (Perlov et al. 2002, 2003), the common harbor porpoise was seen much more frequently in 2003, which could be attributed to the presence of schools of herring.

The common harbor porpoise was seen with almost the same exact frequency whether alone or in a group of three to four porpoises. It was much more rare to find it in groups as large as 8-11 porpoises (see Table 6).

**Pinnipeds**

In 2003, pinnipeds were only observed in the coastal waters off Sakhalin, with rare exception (Figs. 18a and 18b see Appendix 1). Other species were concentrated in different locations. As should be expected, significant congregations of fur seals were seen in the vicinity of their harem rookery (Tyulenii Island). Here, on the eastern side of the Terpeniye Peninsula, 114 fur seals were observed in the coastal waters on 25 July.

*Pinnipedia phocidae* seals, whose species classification could not always be determined from July to September 2003, were seen often throughout the study area (more than 1 km from shore) on the northeastern Sakhalin shelf (see Fig. 18). A total of 131 seals representing three species were encountered in this area. The majority of the 122 seals whose species classification could be determined was made up of ringed seal (73%). Other species included the harbor seal (21%) and the bearded seal (6%). *Pinnipedia phocidae* were seen in large numbers during the first third of August. For example, on 5 August , 40 *pinnipedia phocidae* seals were sighted closer to shore, in an area between the mouths of Piltun and Chayvo bays. On 7 August, 16 ringed seals were seen in the southern part of the Offshore feeding area. In later days of the survey, *pinnipedia phocidae* seals were rarely seen far from shore and their relative abundance along the coast also fluctuated. For example, on 5 August and 13 August, 20 and 18 *pinnipedia phocidae* seals were sighted in the coastal water area between coordinates 52° 55` – 52° 28` N, respectively, while on 19 September there were none observed. One may get a clearer picture of the seasonal dynamics of *pinnipedia phocidae* seals at sea by comparing relative indicators of their frequency of sightings (the average number of animals sighted in one encounter). As it turns out, this indicator was the greatest in July and August and smallest in September, equaling 1.5, 1.6, and 1.2 seals per encounter, respectively. Our data confirm the opinion of certain researchers, that in the summer the *pinnipedia phocidae* seals, primarily the harbor seal and the ringed seal, spend most of their time at sea, and not on shore (Trukhin & Blokhin 2003). Of the other pinnipeds on the northeastern Sakhalin shelf, one fur seal and one northern sea lion were sighted this year. Northern sea lions are listed as “vulnerable” by the Russian Red Book.

**DISCUSSION**

Research studies continued in 2003 in the Sea of Japan, in the Sea of Okhotsk, and off the northeastern Sakhalin coast, with the objective of determining the distribution and relative abundance of gray whales along their migration paths and within their summer feeding areas. From July to September 2003, gray whales were only observed on the northeastern Sakhalin shelf primarily in two known major feeding areas, the Piltun and the Offshore, and that the greatest number of gray whales found in each of them (47-48 whales) occurred in August.

In August 2003 in the Piltun and Offshore feeding areas, the maximum number of observed gray whales observed was similar during dedicated surveys. In other words, the results of the vessel surveys of the gray whales over the past three years on the northeastern Sakhalin shelf were similar (Table 3, Fig. 16). We agree with the opinion of certain researchers (Weller et al. 2002) that aerial observations do not reflect the actual numerical composition of gray whale groups in their feeding areas. The proportion of single whales recorded during aerial observations is significantly different from that recorded during vessel

surveys, constituting 60.4 – 87.5% (Weller et al. 2002, Sobolevsky 2004, Blokhin et al. 2002, Perlov et al. 2002) and 52.9 – 54.5% (Würsig et al. 2000, M. Maminov pers. obs.), respectively.

The presence of actively feeding gray whales beyond the presently defined eastern borders of the Offshore feeding area confirms that, for these animals, suitable feeding areas are found not only within the defined survey area, but over a much larger area. This is corroborated by the results of benthos surveys on the northeastern Sakhalin shelf (Koblikov 1985; Chuchukalo and Nadtochii 2003; Fadeev 2003a,b; Fadeev 2004). It is important to note, however, that suitable prey may not be uniformly present throughout the Offshore feeding area and that the discovery that the boundaries of the area may be larger does not necessarily mean that more food is available. It also cannot be ruled out that one of the reasons for the whales' eastern distribution in the Offshore feeding area may have been the presence of fishing vessels in that area, one of which was trawl fishing. It is possible that such a factor could displace the local gray whale population and other marine mammals.

From late August to mid-September, it appeared that more whales were observed in the north and the south of the Piltun Bay feeding area. One such site was in the south, near the Piltun estuary between the coordinates 52° 48` – 52° 59` N. lat.; the other was in the northern part of this area inside the water area with coordinates 53° 12` – 53° 22` N. lat. In mid-September whales were observed to be distributed in a relatively uniform distribution. Use of these areas in late September is difficult to assess due to decreased survey effort in these areas at this time. A high density of whales has been previously reported (1) along the southern portion of the Piltun feeding area near the mouth of the lagoon (Weller et al. 2002) where cows-calf pairs are commonly observed (ENL/SEIC unpublished data) and (2) in the northern part of the Piltun feeding area (Blokhin et al. 2003, Würsig et al. 2003, Gailey et al. 2004). We also observed cow-calf pairs in the southern end of the feeding area, however reasons for cows to select this habitat are not understood. New information on the identity, distribution and abundance of gray whale prey (Fadeev 2003a, 2003b; Fadeev 2004) and the movement of individuals from photo-identification (Yakovlev & Tyurneva 2003, 2004, D. Weller pers. comm. 2004) may help explain aggregations and seasonal shifts in the distribution of whales within and between the Piltun and Offshore feeding areas both within and between seasons.

Recent monitoring studies sponsored by SEIC and ENL have documented within and between-season shifts in the distribution of western gray whales along the northeast coast of Sakhalin Island in the Piltun and Offshore feeding areas (Weller et al. 2000, 2001; Würsig et al. 1999, 2000, 2002, 2003; Johnson 2002, Yakvenko et al. 2002; Blokhin et al. 2003, 2004; Perlov et al. 2003; Gailey et al. 2004) during periods of industrial activity and during baseline years with little industrial activity. These within and between season 'shifts' in the distribution of gray whales in both the Piltun and Offshore feeding areas are thought, in part, to be a response to seasonal changes in the distribution and abundance of prey (Weller et al. 2002, Fadeev 2003a,b). In 2001, seismic surveys were conducted in the Odoptu block and some whales may have avoided this area during that period (Johnson 2002, Yazvenko et al. 2002).

Seasonal variability in the distribution of cetaceans has been extensively reported and is thought to be a response to seasonal habitat fluctuations and movements of prey (Payne et al. 1986, 1990; Kenney et al. 1995, Wilson et al. 1997, Forney and Barlow 1998, Karczmarski et al.1999). Eastern gray whales feeding along the west coast of Vancouver Island, Canada, rotate feeding sites and prey types within and between summer feeding seasons as a function of the distribution and abundance of their prey (Bass 2000; Dunham and Duffus 2001, 2002; Meier 2003, Kopach 2004). The distribution of feeding eastern gray whales along the west coast of North America is variable within and between years with whales utilizing areas from northern California to southeast Alaska from spring to fall involving significant interchange of individuals (confirmed with photo-id) between areas with variable use of habitat within and between years (Calambokidas et al. 2002). Eastern gray whales are dynamic and selective foragers that can use various types of prey and foraging tactics rapidly to take advantage of short-term availability of energy and are not exclusively benthic foragers (Dunham and Duffus 2001, 2002; Moore et al. 2003). Eastern gray whales are multi-scale animals that can show site-fidelity at a regional scale (e.g. northeast Sakhalin Island) but can range over a larger area to use smaller sites or "nodes" within the region as a function of the distribution and abundance of prey over time (Calambokidas et al. 2002). In addition to responding to the distribution and abundance of prey, there is some evidence that eastern gray whales and other apex predators can significantly influence the distribution and abundance of their prey through foraging (Bowen 1997, Meier 2003). These "top-down" effects can alter a prey community to the extent that whales will abandon it for months or years while it recovers to a richness than can be utilized again, influencing the seasonal distribution of the whales (Bass 2000). Although western gray whales are genetically isolated from eastern gray whales, it is likely that the manner in which eastern and western gray whales make foraging decisions in response to the distribution and abundance of prey in different ecological contexts is similar.

In summary, gray whales were observed in both the Piltun and Offshore feeding areas however the distribution of whales within these areas changed within and between seasons. In the Piltun area, whales were observed throughout the feeding area as observed in 2001 and 2002, however it appeared that whales were aggregated in the north and south ends of the feeding area during parts of the season. In the Offshore area, whales were observed distributed from the southwest to the northeast as observed in 2001 and 2002, however whales were also observed further east in deeper water than in 2001 and 2002. Some of the observed distribution patterns over time may in part be explained by changes in the distribution and abundance of prey. Prey studies have been conducted from 2001-2003 (Fadeev 2003a, 2003b) and additional analyses overlapping prey density and abundance with the distribution and abundance of whales both within and between seasons are recommended to understand seasonal changes in the distribution and abundance of gray whales. As 2002 and 2003 were baseline years with little or no industrial activity, they provide valuable information as to natural variability of whale movements along the northeast Sakhalin coast. Understanding natural causes of whale movements is important in assessing and quantifying potential impacts of future industrial development.

The frequency of sightings of other marine mammals on the northeastern Sakhalin shelf in 2003 was similar as in 2001 and 2002. One exception was the common harbor porpoise, whose number had increased several fold.

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FIGURES

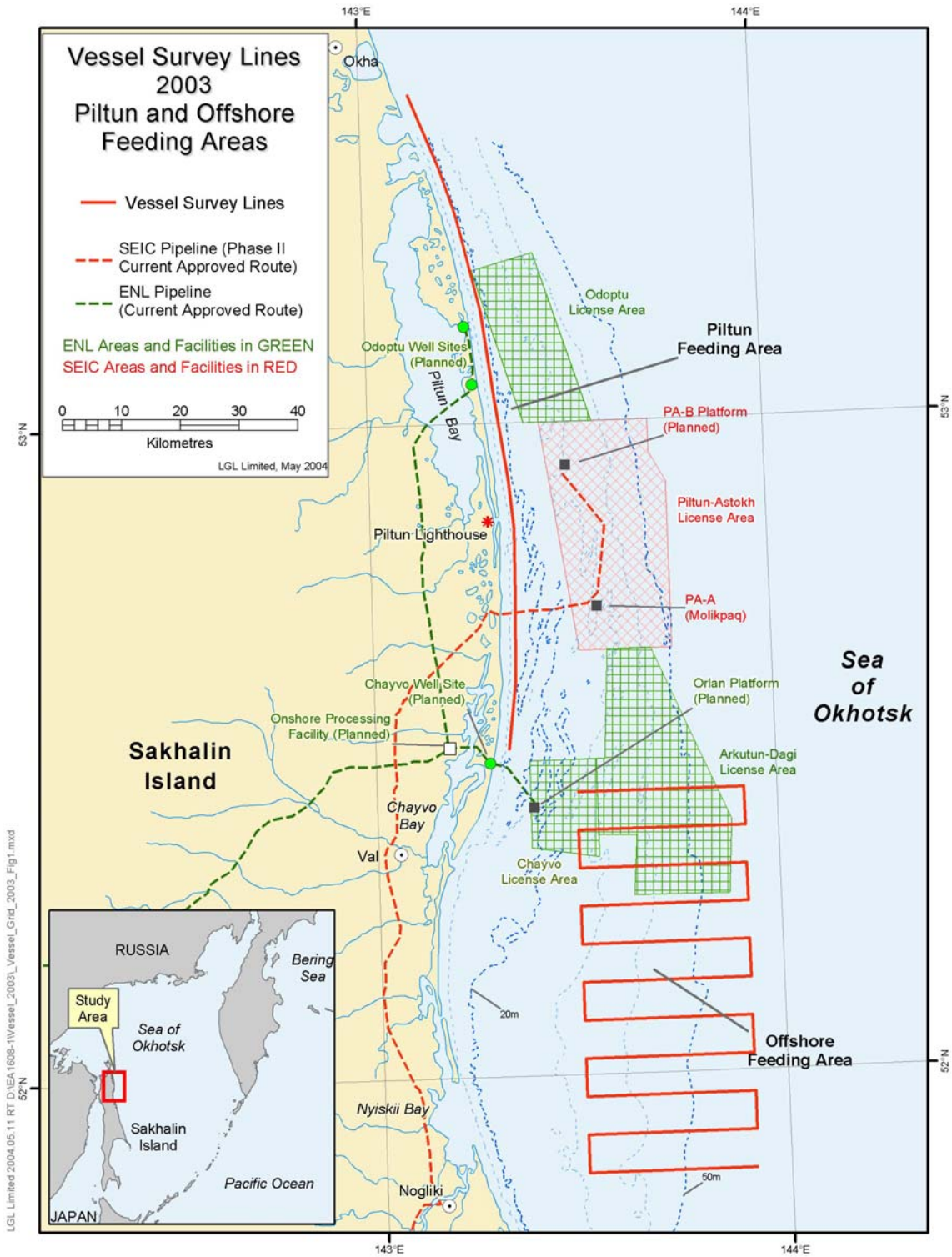


Figure 1. Vessel survey lines in the Piltun and Offshore feeding areas located along the northeast coast of Sakhalin Island, Russia, 2003.

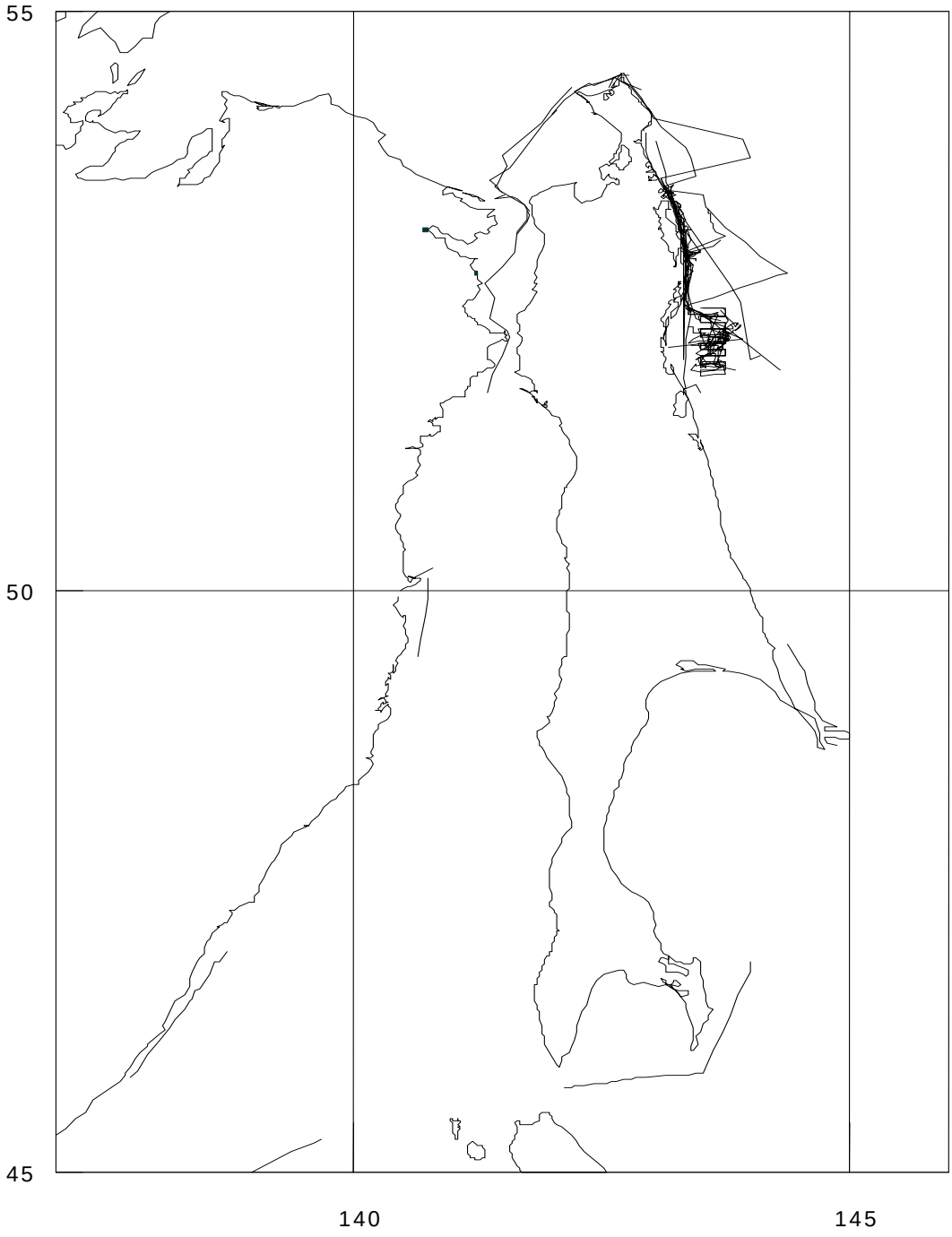


Figure 2. Vessel tracklines recorded during daylight observations July-September, 2003.

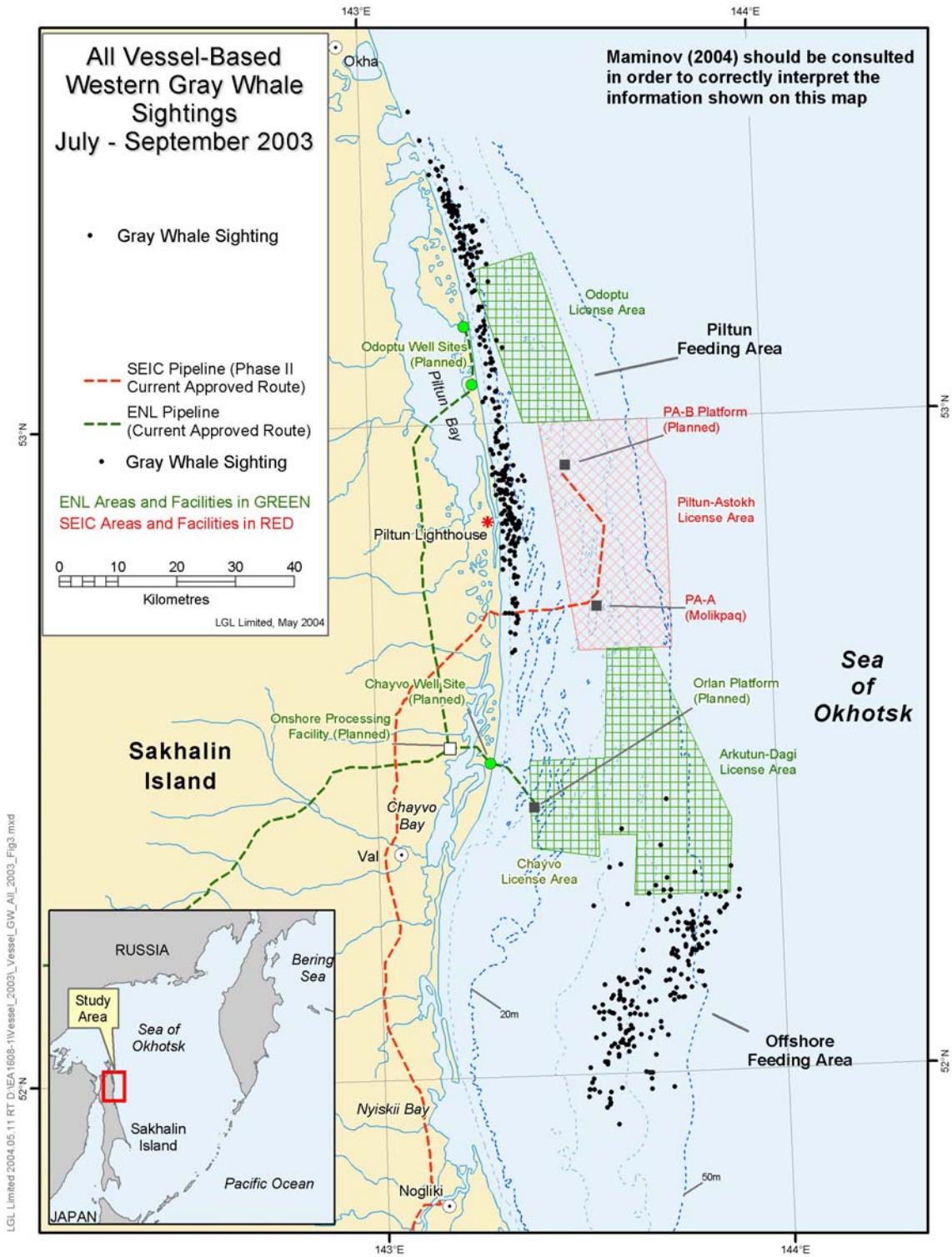


Figure 3. Gray whale sightings recorded during all vessel-based activities along the northeast coast of Sakhalin Island, Russia, 2003.

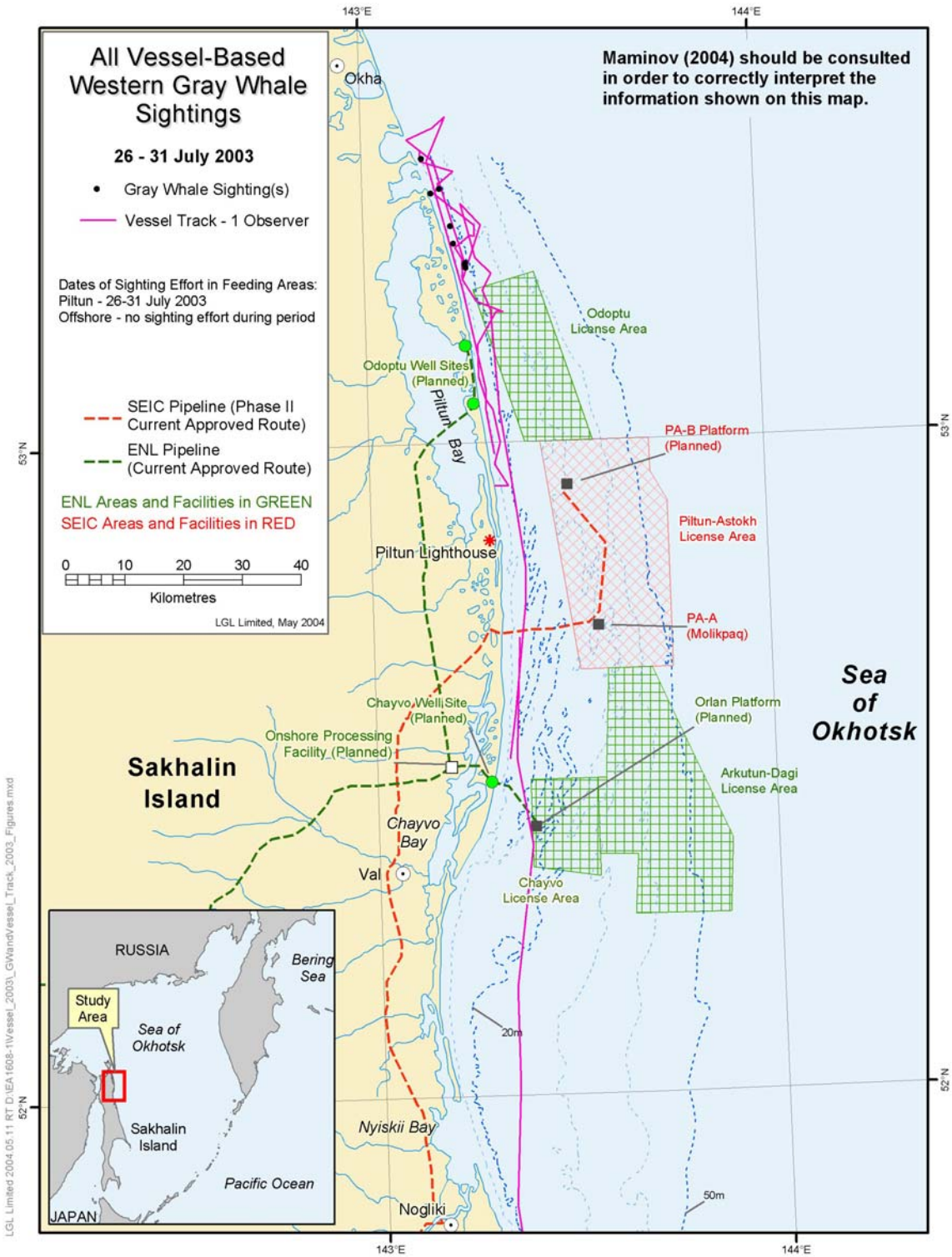


Figure 4 (a). Gray whale sightings recorded during all vessel-based activities from 26-31 July along the northeast coast of Sakhalin Island, Russia, 2003.

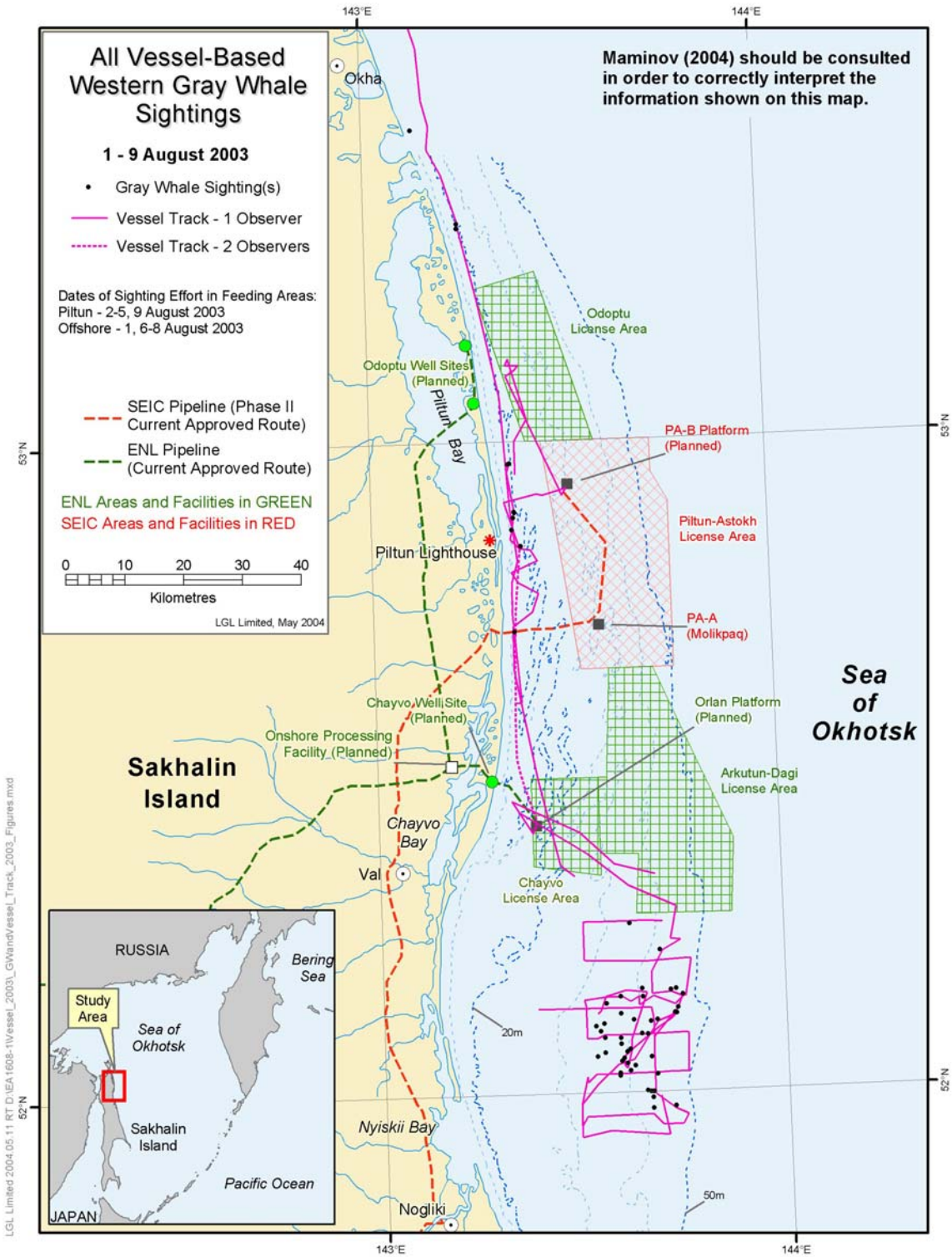


Figure 4 (b). Gray whale sightings recorded during all vessel-based activities from 1-9 August along the northeast coast of Sakhalin Island, Russia, 2003.

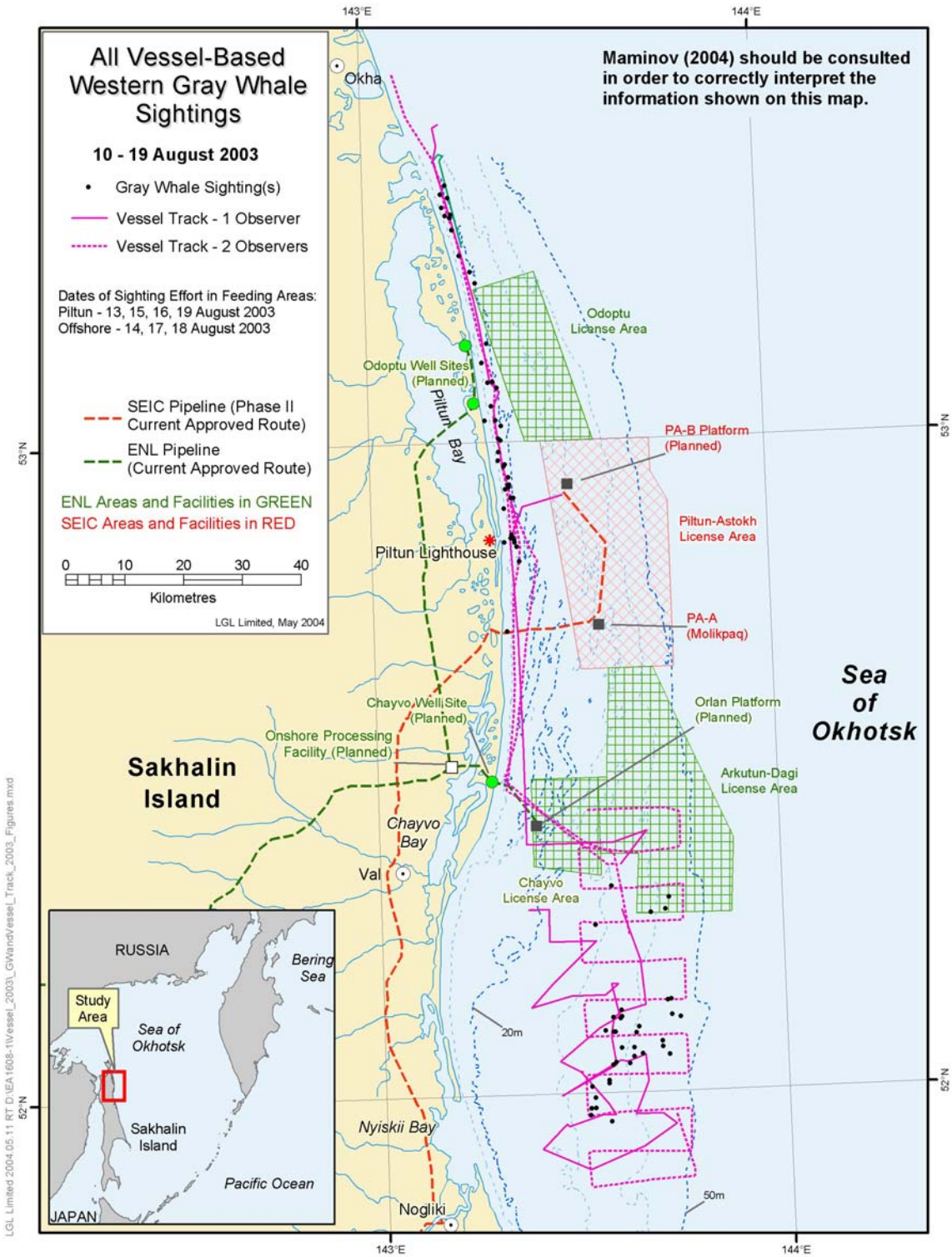


Figure 4 (c). Gray whale sightings recorded during all vessel-based activities from 10-19 August along the northeast coast of Sakhalin Island, Russia, 2003.

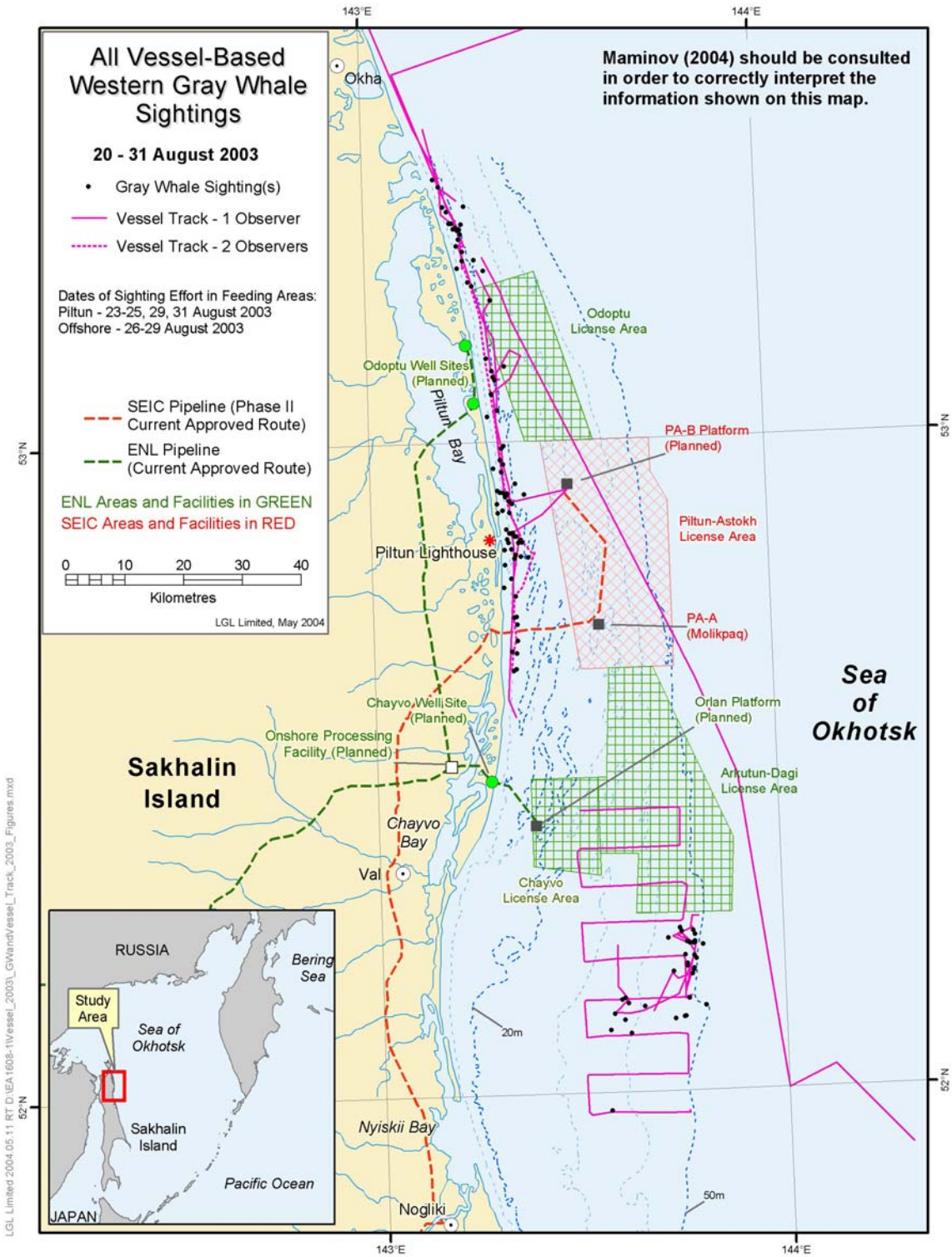


Figure 4 (d). Gray whale sightings recorded during all vessel-based activities from 20-31 August along the northeast coast of Sakhalin Island, Russia, 2003.

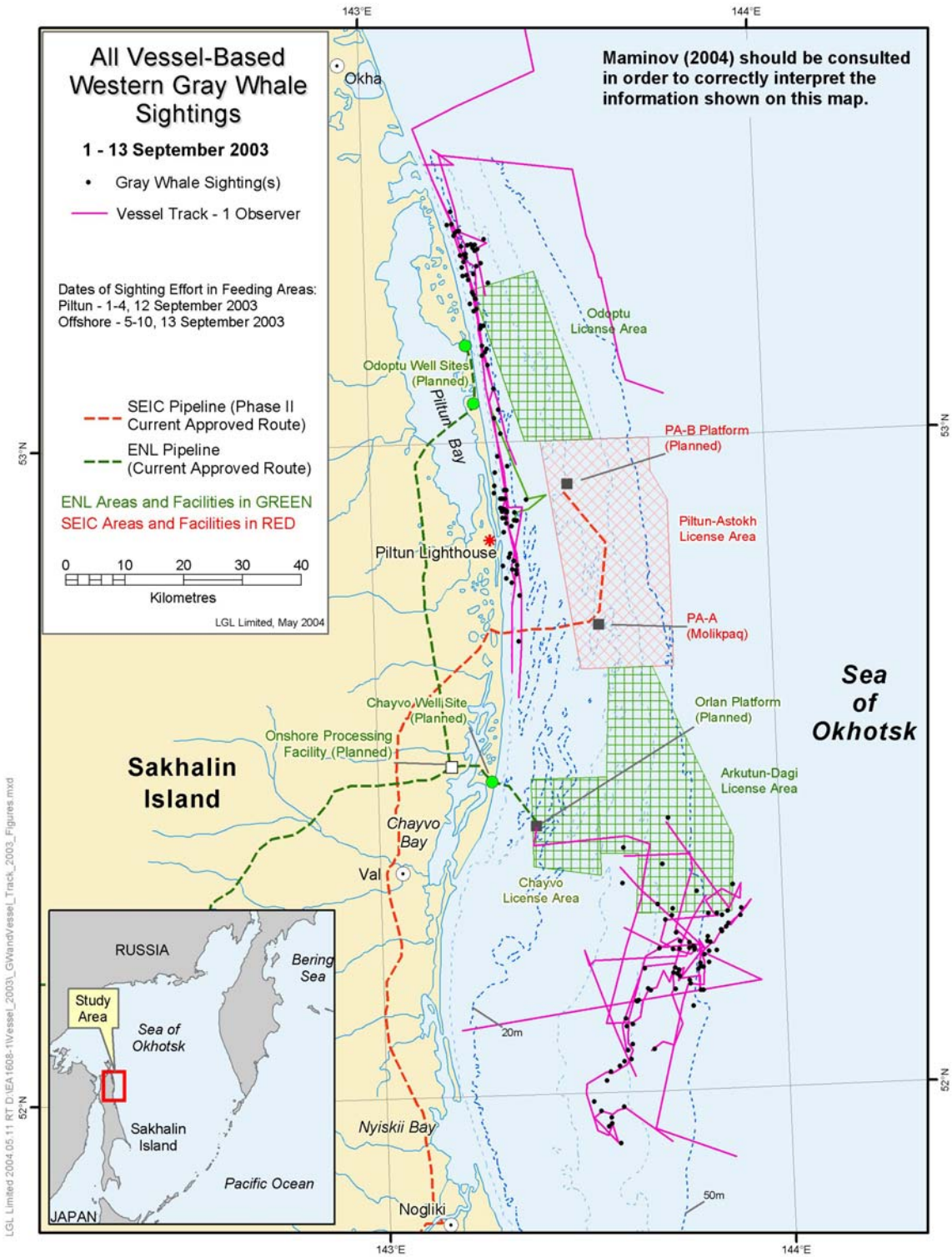


Figure 4 (e). Gray whale sightings recorded during all vessel-based activities from 1-13 September along the northeast coast of Sakhalin Island, Russia, 2003.

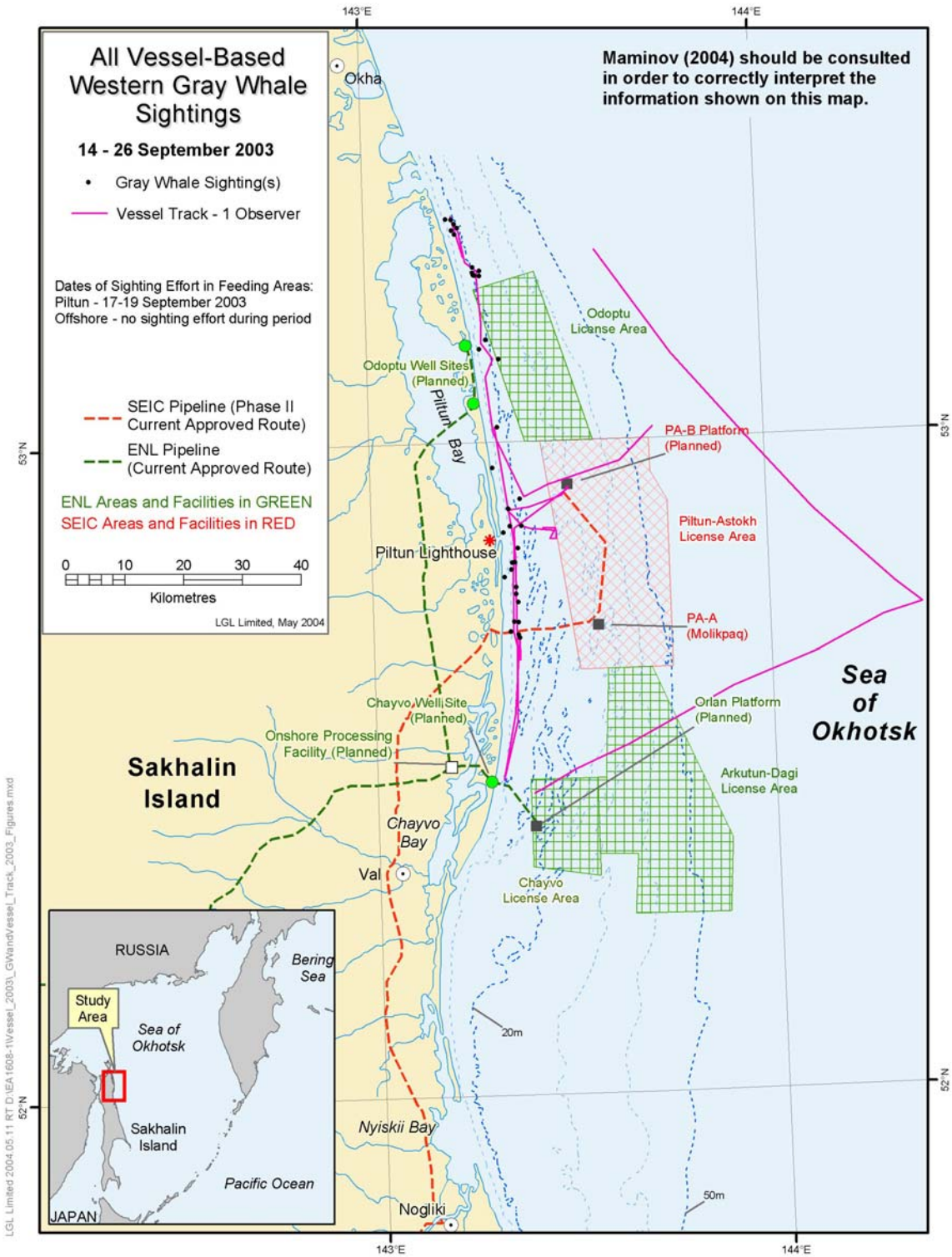


Figure 4 (f). Gray whale sightings recorded during all vessel-based activities from 14-26 September along the northeast coast of Sakhalin Island, Russia, 2003.

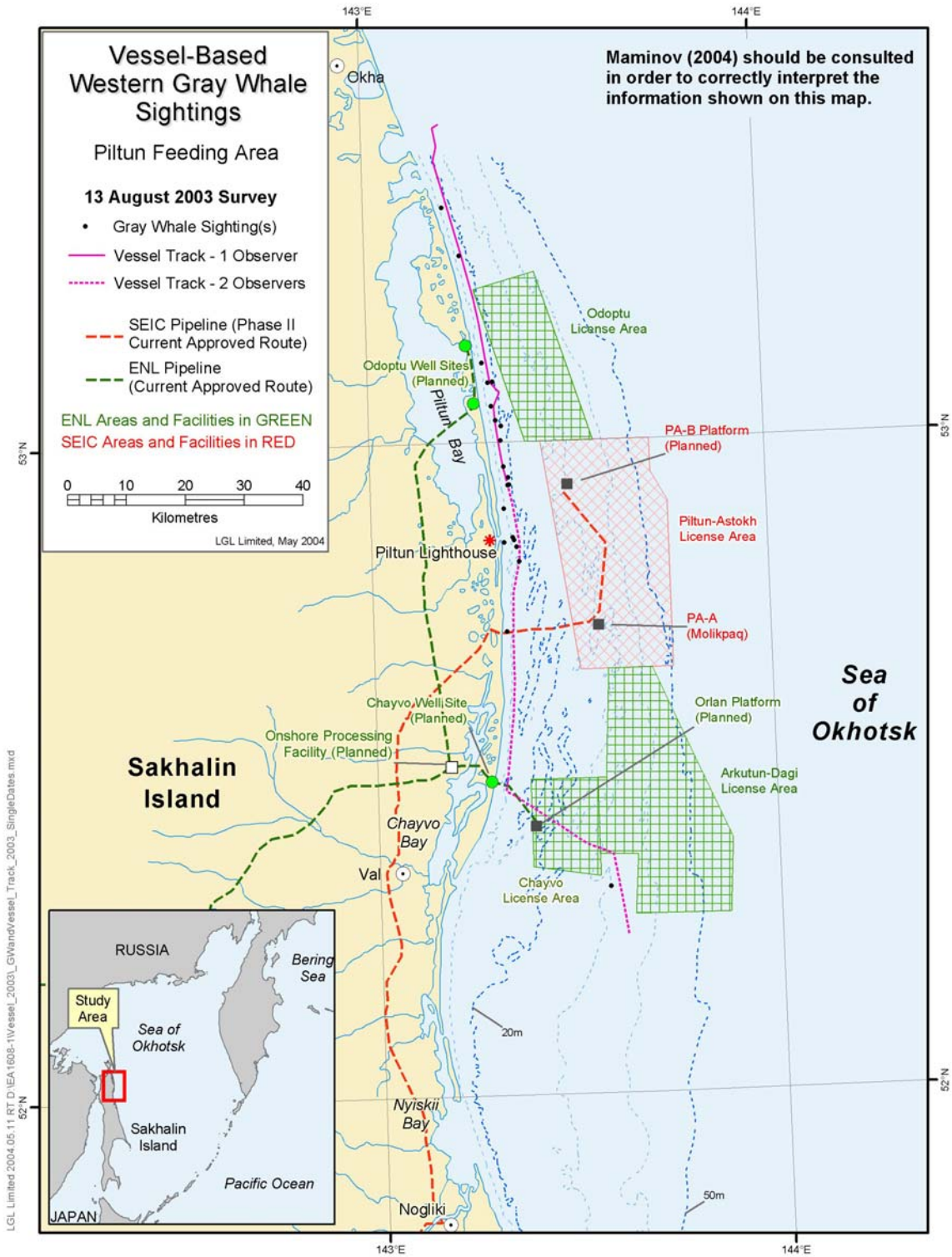


Figure 5. Gray whale sightings recorded during a vessel survey in the Piltun gray whale feeding area, 13 August 2003.

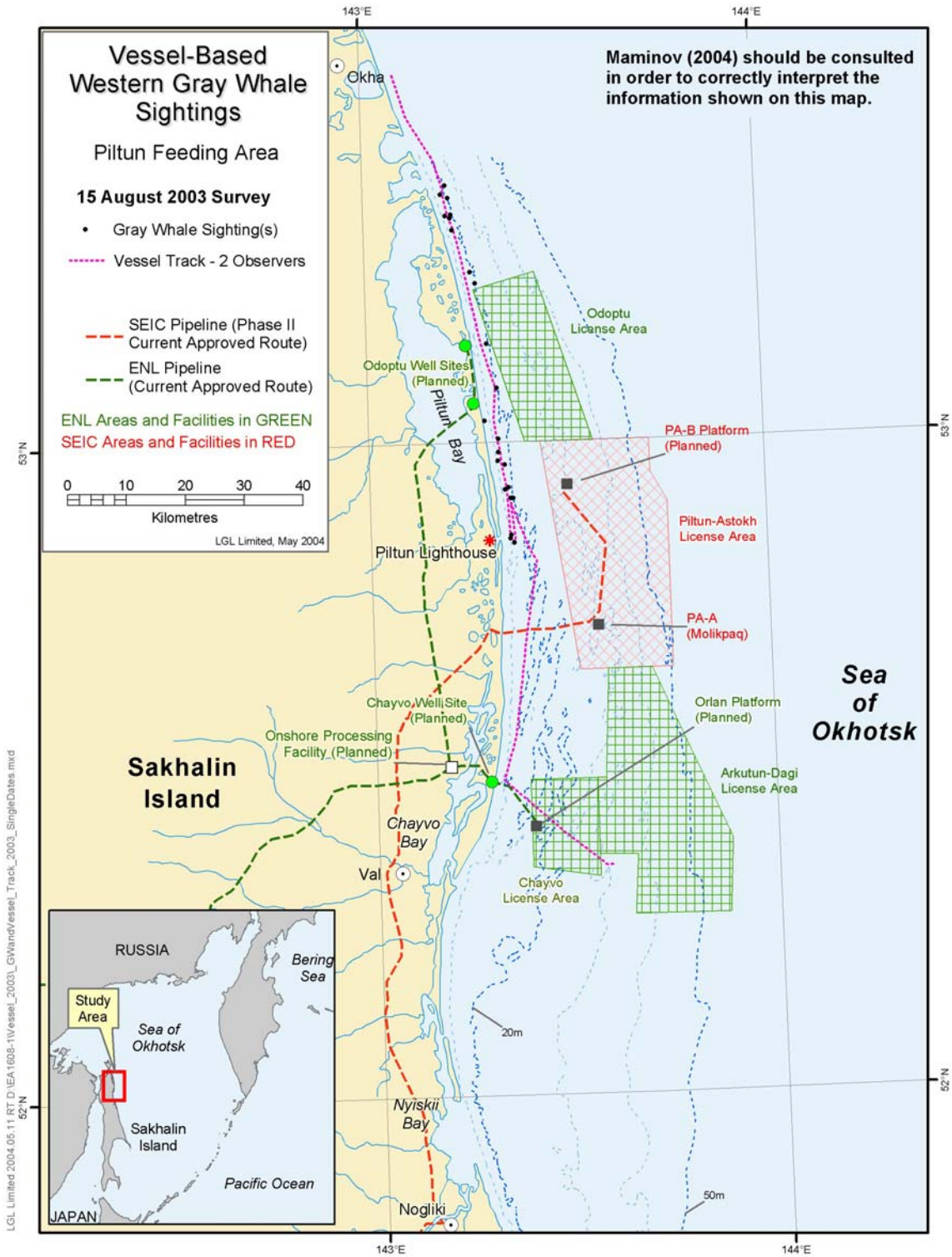


Figure 6. Gray whale sightings recorded during a vessel survey in the Piltun gray whale feeding area, 15 August 2003.

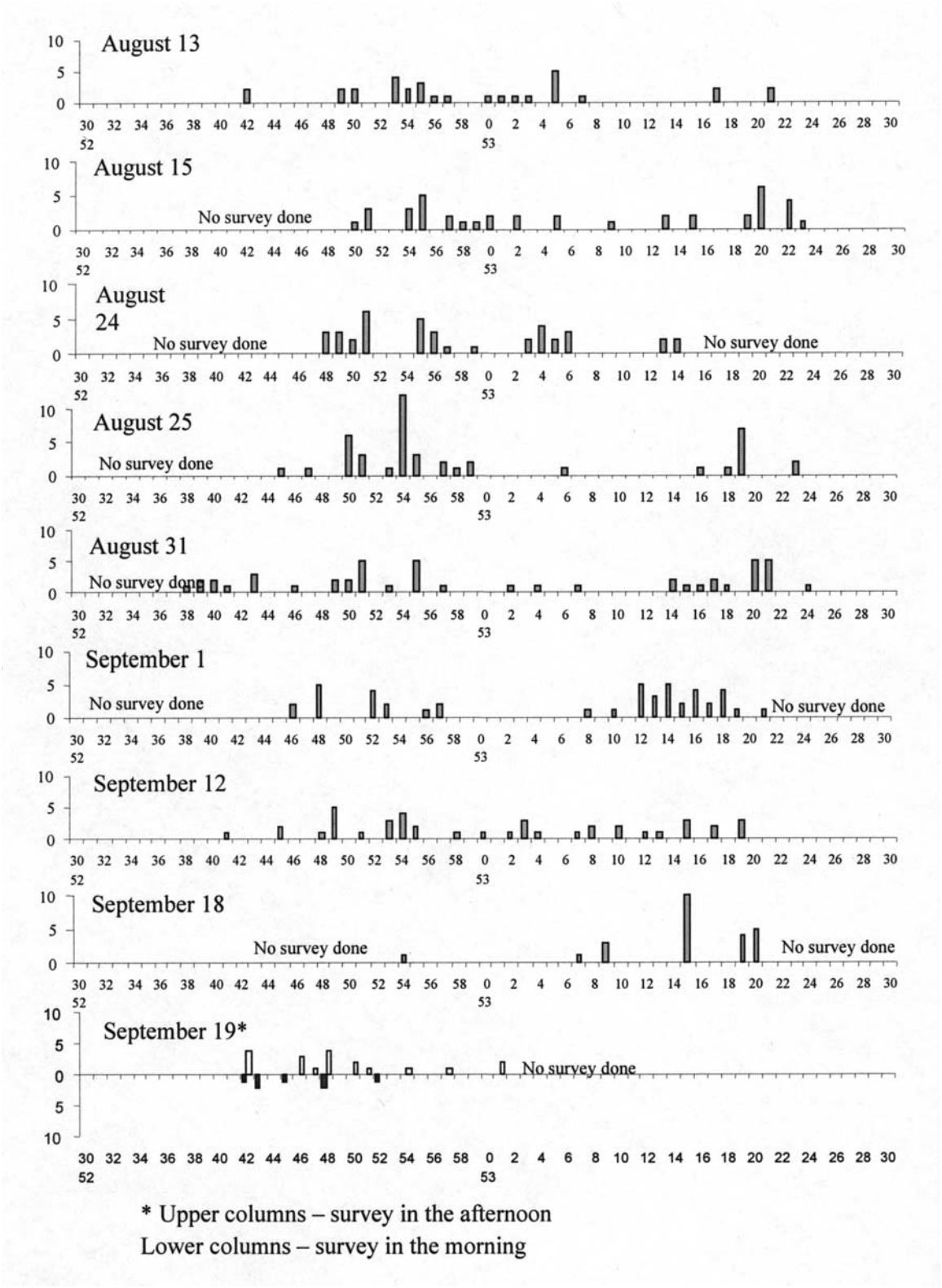


Figure 7. Distribution and abundance of gray whales during dedicated vessel surveys categorized by latitude in the Piltun Bay feeding area from August-September, 2003.

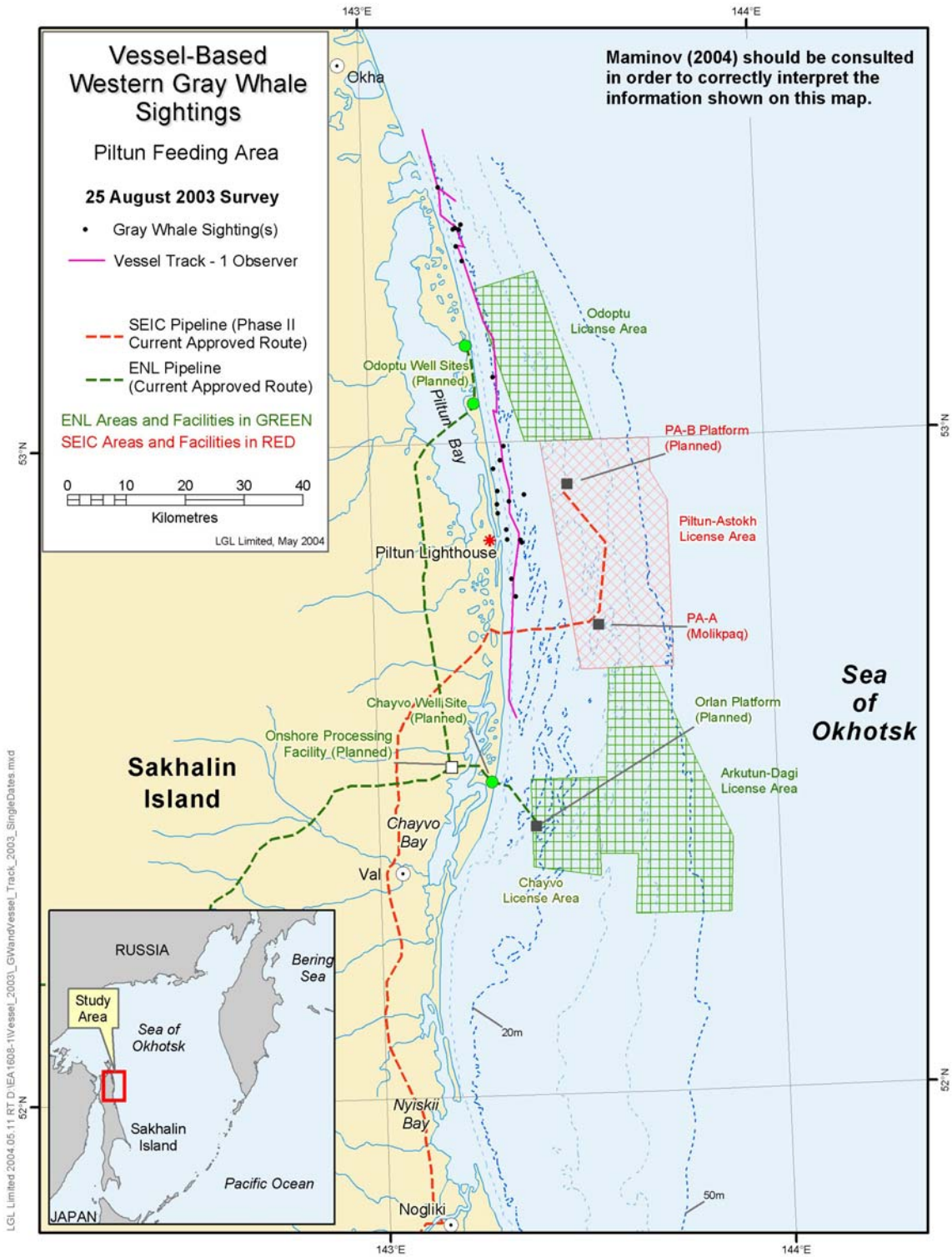


Figure 8. Gray whale sightings recorded during a vessel survey in the Piltun gray whale feeding area, 25 August 2003.

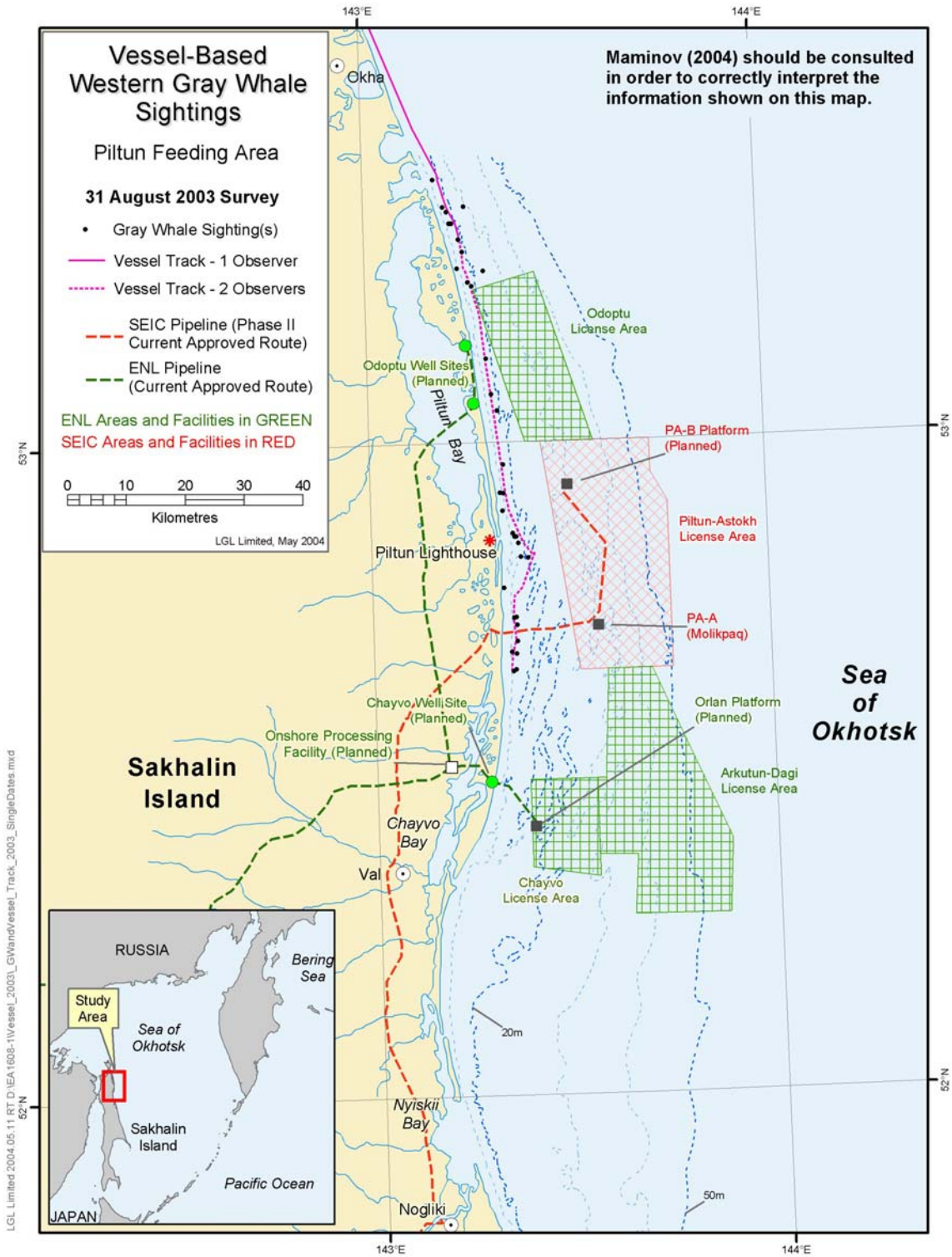


Figure 9. Gray whale sightings recorded during a vessel survey in the Piltun gray whale feeding area, 31 August 2003.

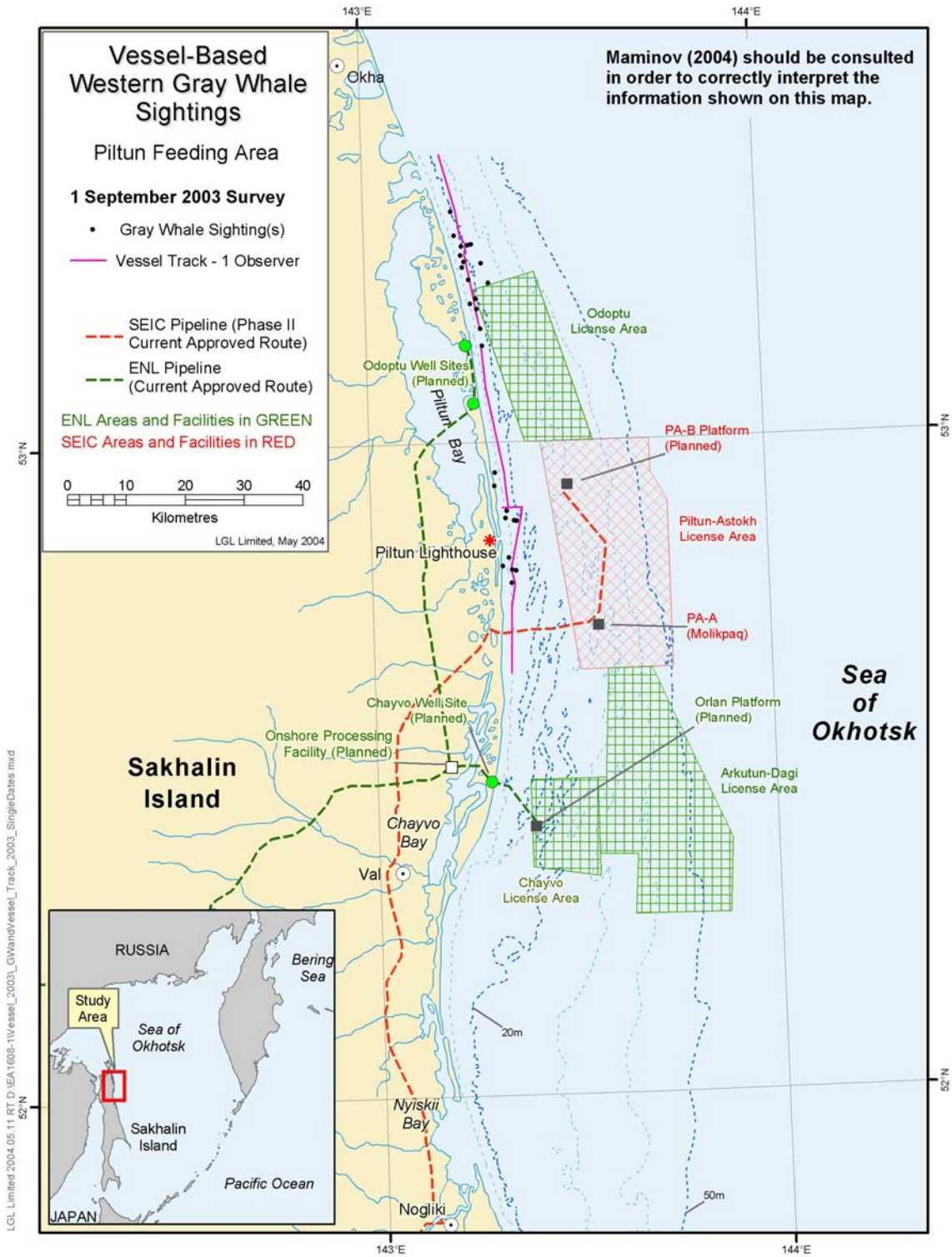


Figure 10. Gray whale sightings recorded during a vessel survey in the Piltun gray whale feeding area, 1 September 2003.

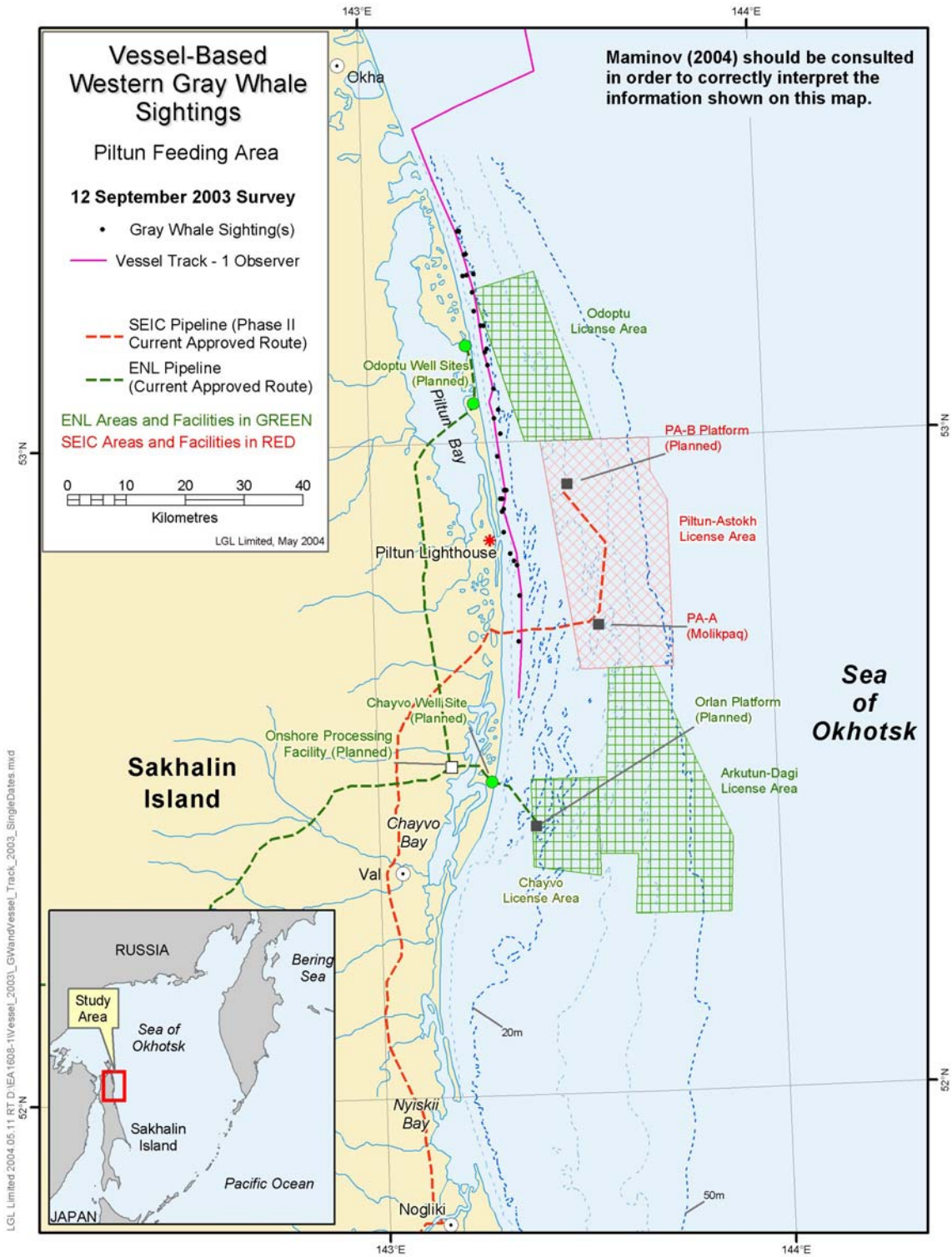


Figure 11. Gray whale sightings recorded during a vessel survey in the Piltun gray whale feeding area, 12 September 2003.

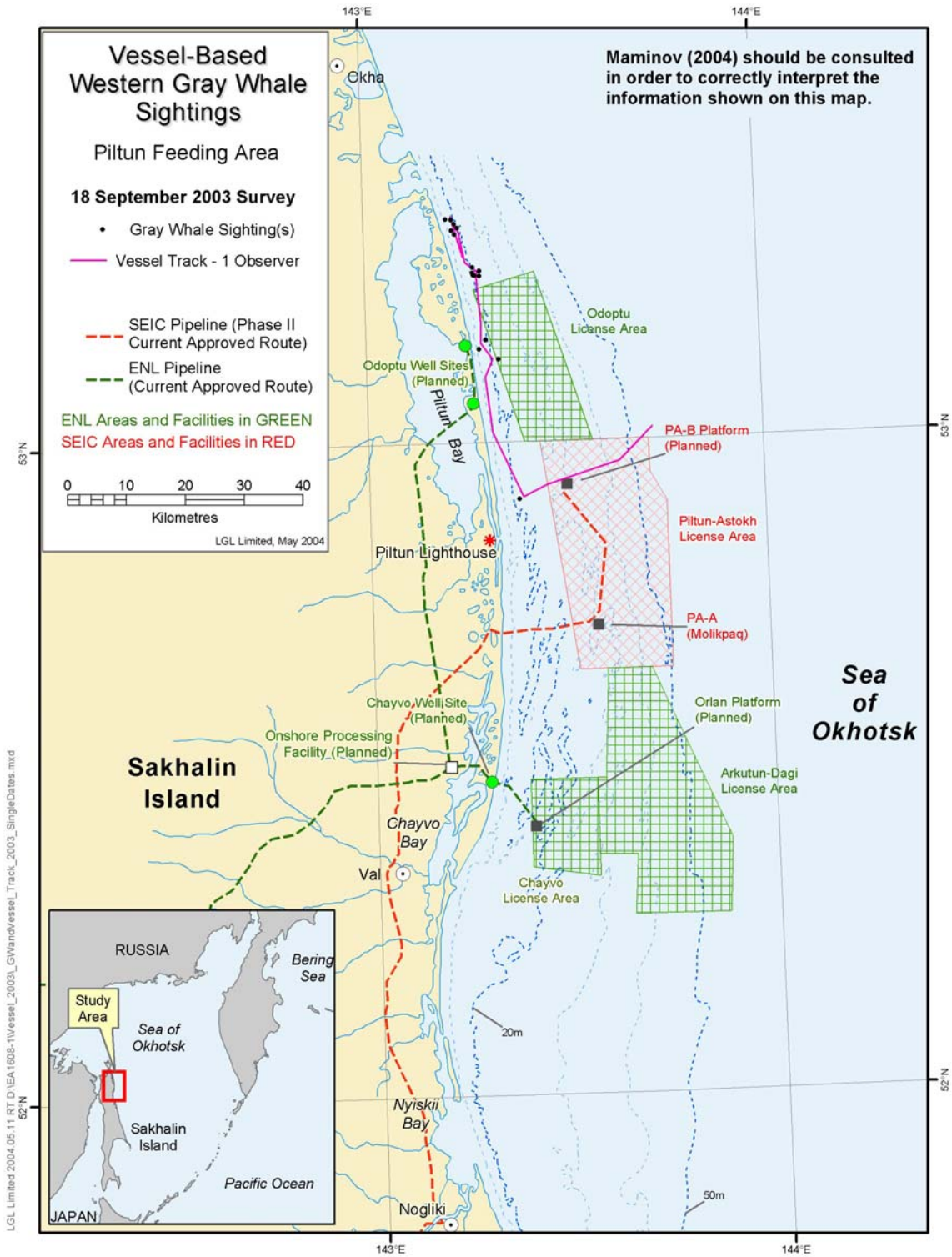


Figure 12. Gray whale sightings recorded during a vessel survey in the Piltun gray whale feeding area, 18 September 2003.

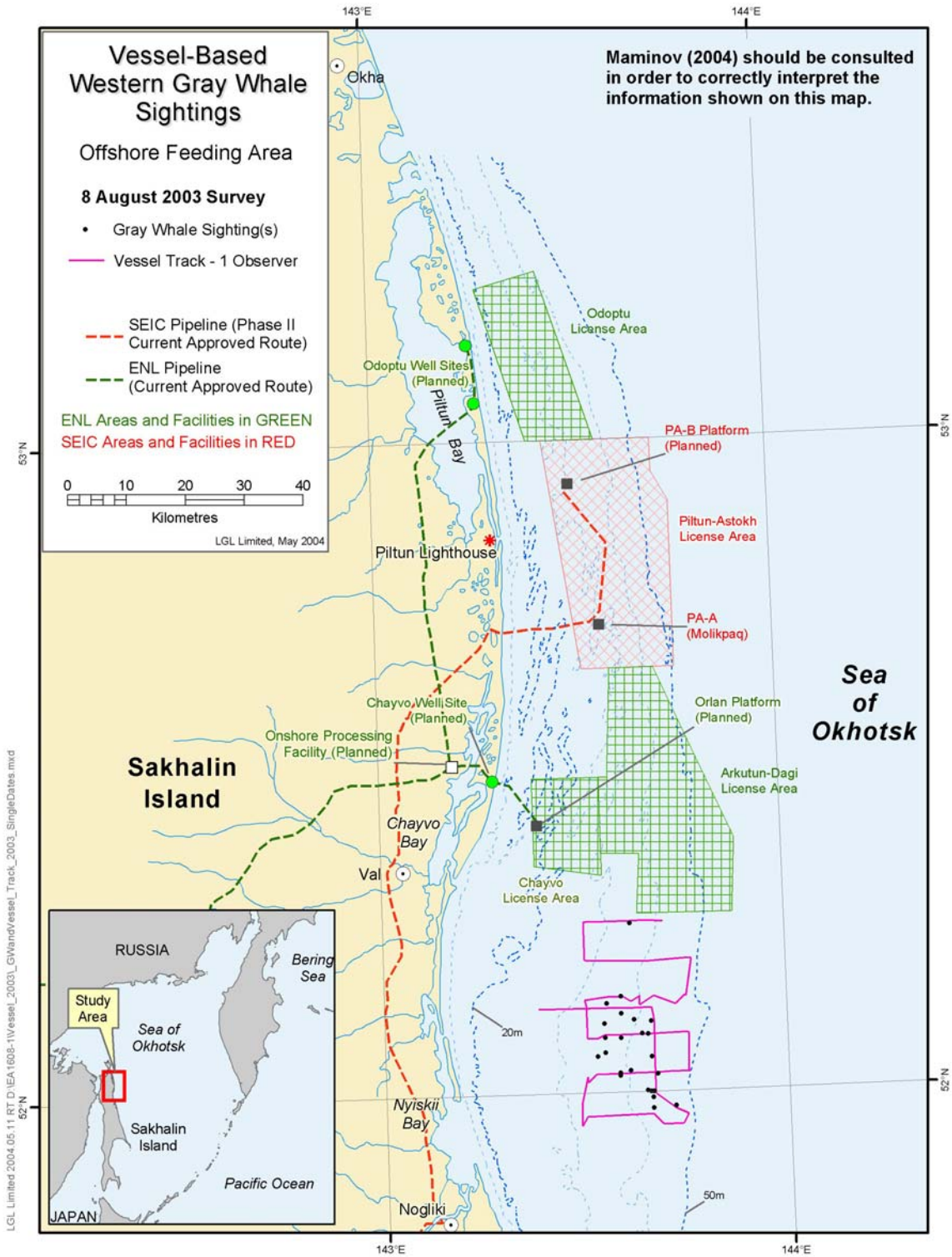


Figure 13. Gray whale sightings recorded during a vessel survey in the Offshore gray whale feeding area, 8 August 2003.

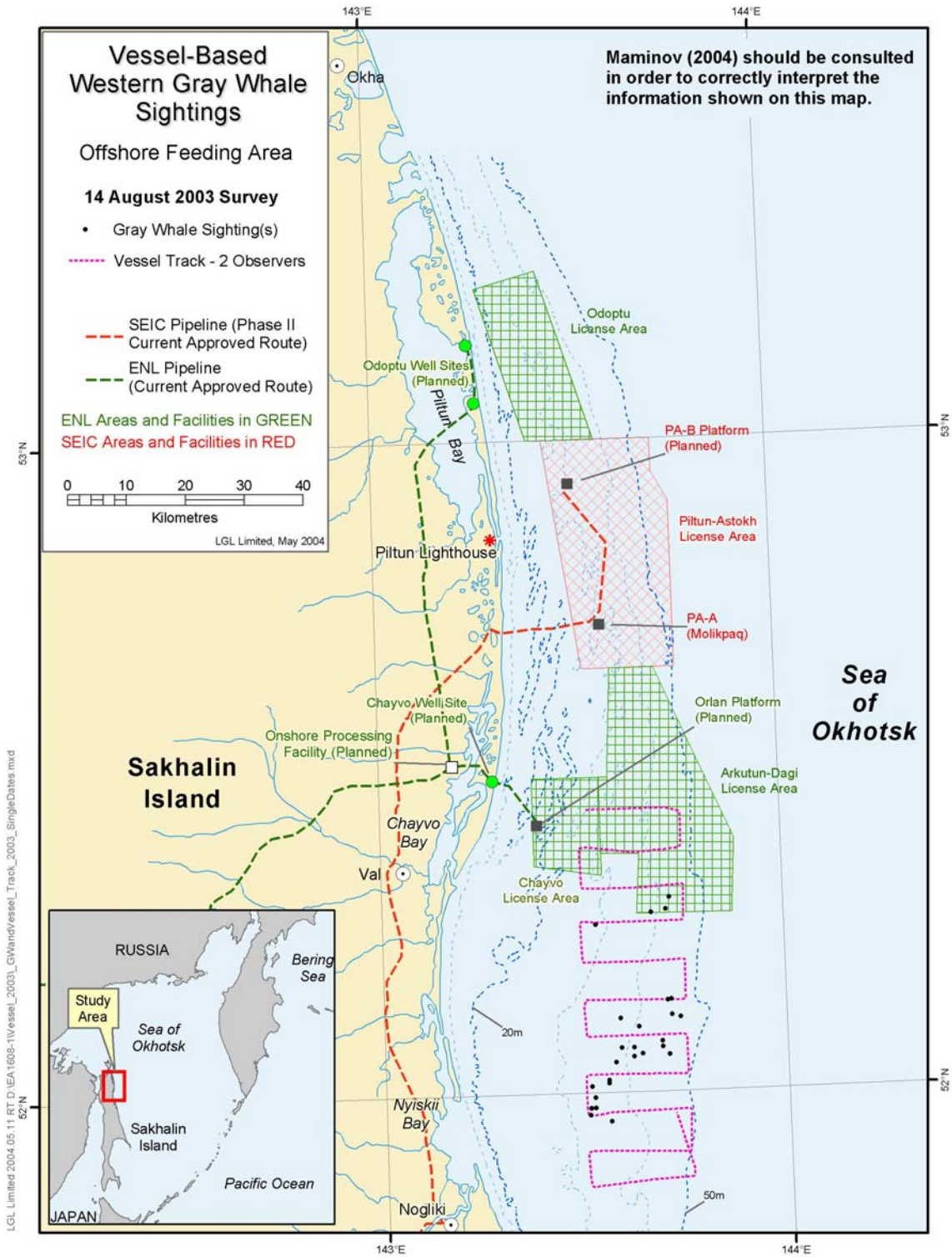


Figure 14. Gray whale sightings recorded during a vessel survey in the Offshore gray whale feeding area, 14 August 2003.

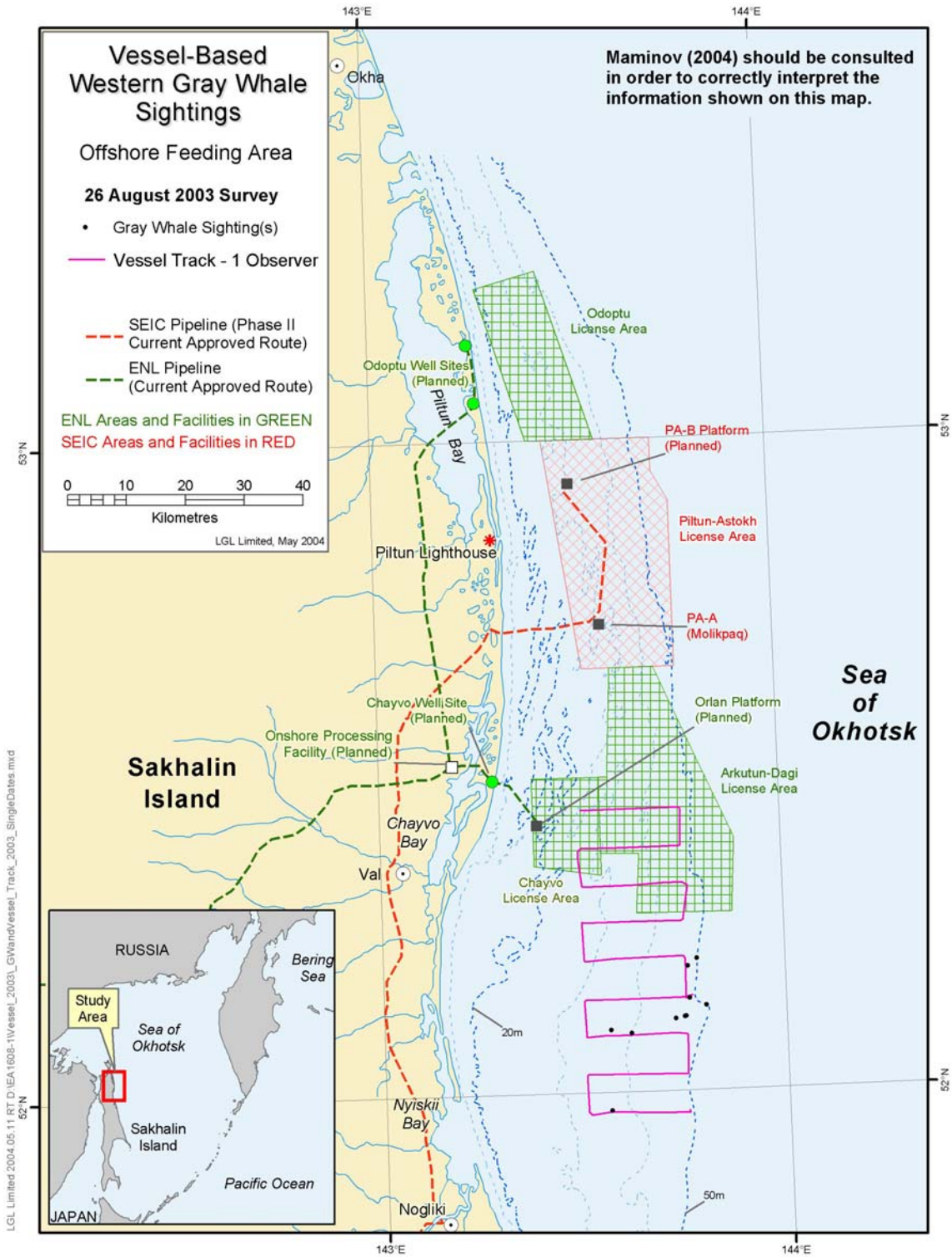


Figure 15. Gray whale sightings recorded during a vessel survey in the Offshore gray whale feeding area, 26 August 2003.

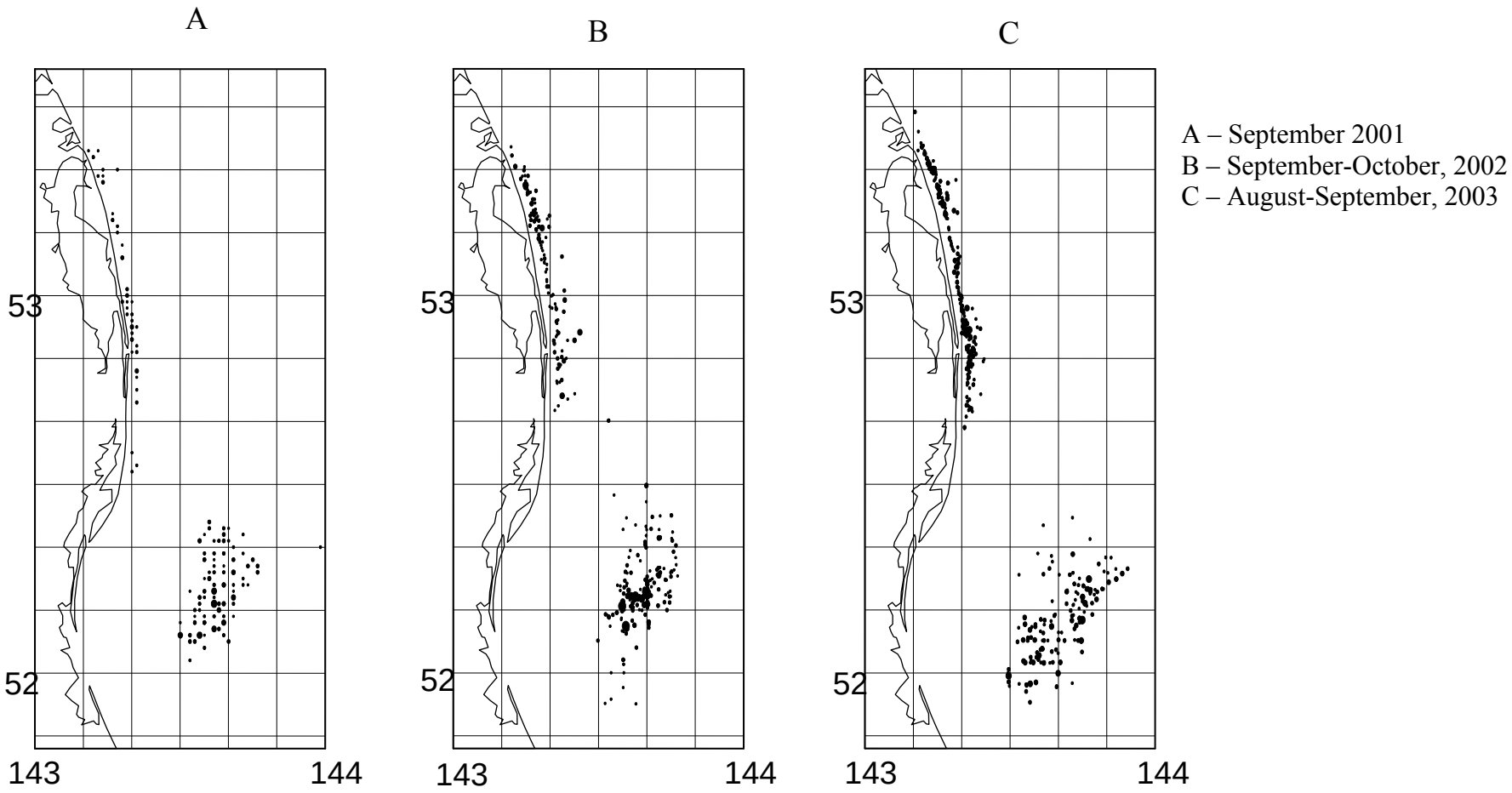


Figure 16. Interseasonal changes in the distribution of gray whale sightings along the northeast coast of Sakhalin Island, 2001-2003 (not taking into consideration varying effort between years).

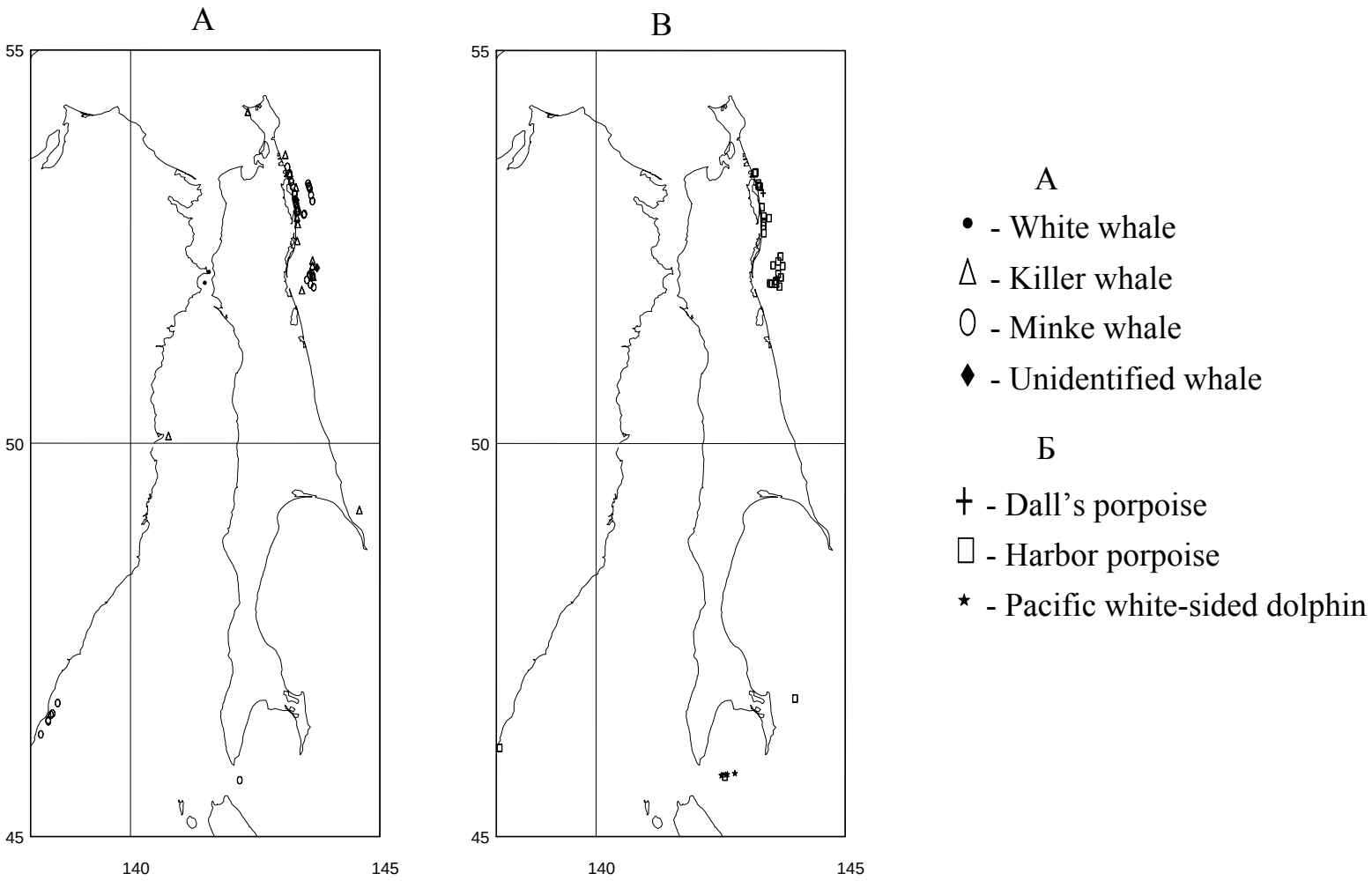


Figure 17. Cetacean sightings recorded during all vessel-based activities in the Okhotsk Sea, Russia, July-September 2003.

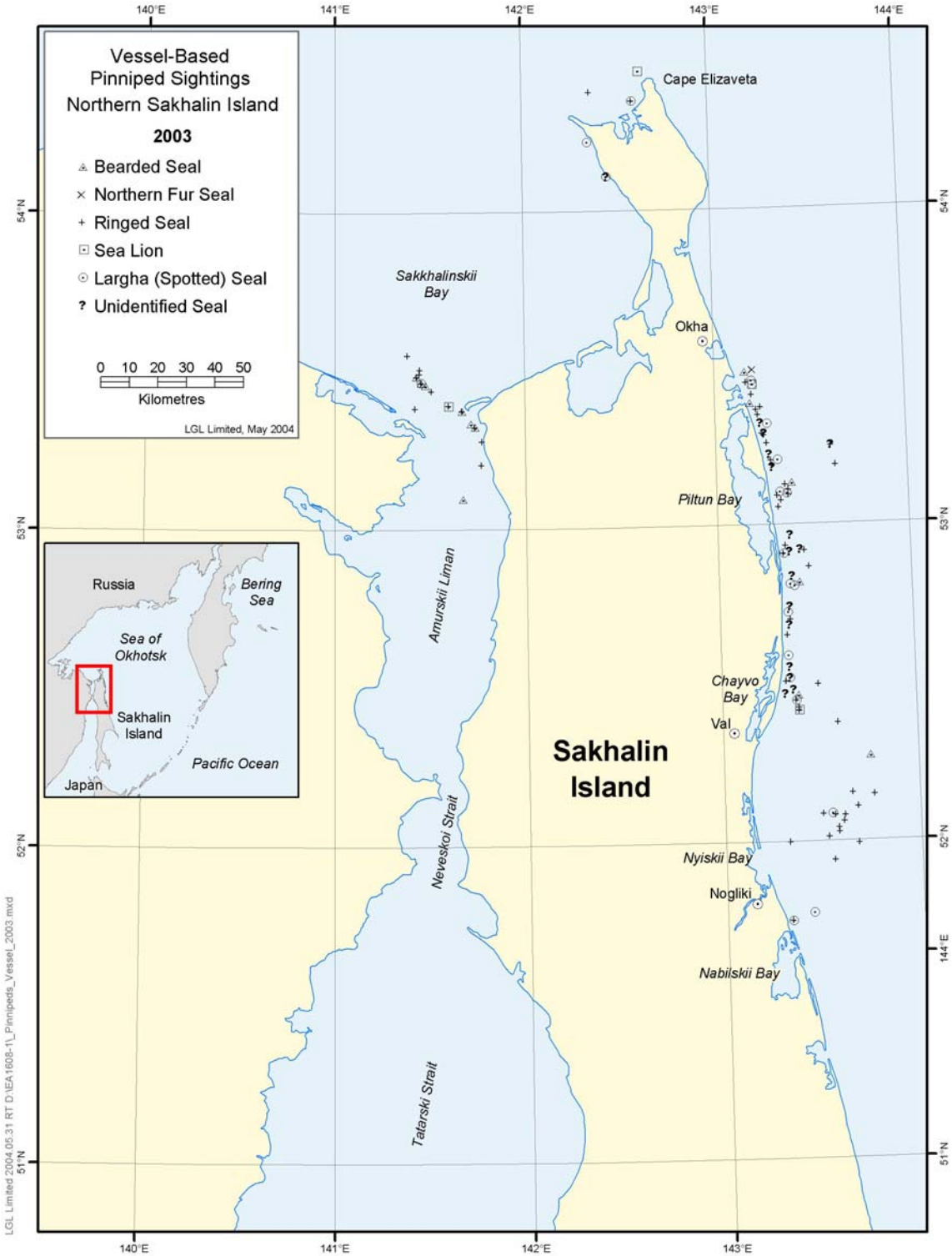


Figure 18 (a). Pinniped sightings recorded during all vessel-based activities along north Sakhalin Island, Russia, July-September 2003.

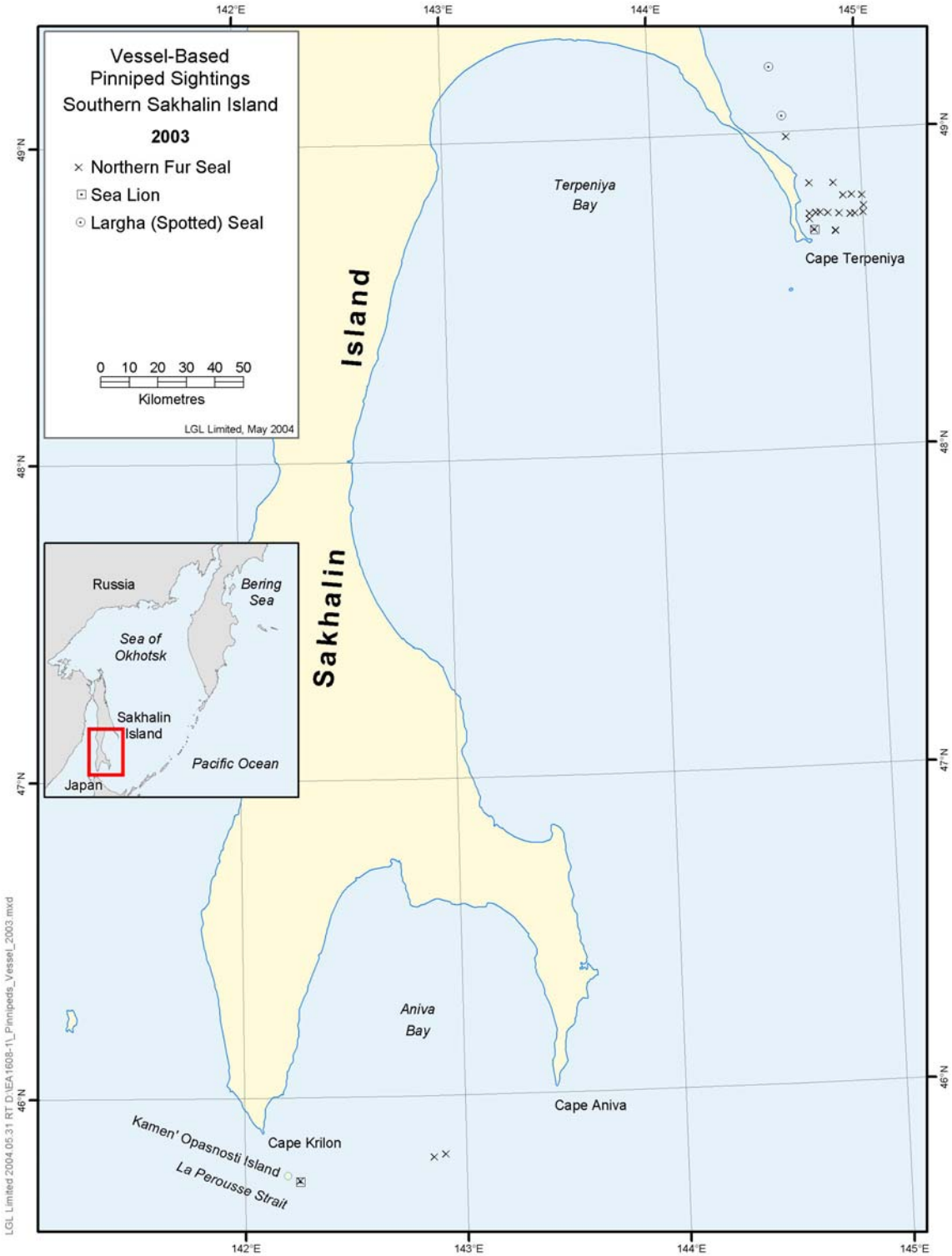


Figure 18 (b). Pinniped sightings recorded during all vessel-based activities along south Sakhalin Island, Russia, July-September 2003.

TABLES

Table 1. Results of dedicated vessel-based surveys of western gray whales in the Piltun feeding area from August-September, 2003.

| | Date | Coordinates | | | | | | Total | Part of route surveyed |
|---|---|---|---|---|---|---|---|---|---|
| | | **52°30′-52°39′** | **52°40′-52°49′** | **52°50′-52°59′** | **53°00′-53°09′** | **53°10′-53°19′** | **53°20′-53°29′** | | |
| **time of survey** | | 15:31-17:00 | **14:41-15:20** | **13:08-14:40** | **11:01-13:07** | **9:41-11:00** | **8:00-9:40** | | |
| visibility in km | Aug. 13 | 6 | 6-8 | 6 | 6 | 6 | 6-8 | | |
| sea state in points | Aug. 13 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | | |
| number of groups | Aug. 13 | 0 | 2 | 9 | 7 | 1 | 1 | **20** | **100%** |
| number of animals | Aug. 13 | 0 | 4 | 13 | 10 | 2 | 2 | **31** | |
| **time of survey** | | **9:45-10:59** | **11:00-12:00** | **12:01-14:46** | **14:47-15:45** | **15:46-17:07** | **17:08-19:00** | | |
| visibility in km | Aug. 15 | 0.5 | 2 | 2 | 2 | 2 | 2 | | |
| sea state in points | Aug. 15 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | | **70%** |
| number of groups | Aug. 15 | 0 | 0 | 10 | 4 | 3 | 6 | **23** | |
| number of animals | Aug. 15 | 0 | 0 | 16 | 7 | 6 | 11 | **40** | |
| **time of survey** | | **6:30-7:10** | **7:11-8:34** | **8:35-11:00** | **11:01-14:00** | **14:01-16:35** | **16:36-19:40** | | |
| visibility in km | Aug. 25 | 10 | 10 | 10 | 10 | 10 | 10 | | |
| sea state in points | Aug. 25 | 2 | 1 | 0-1 | 0-1 | 1 | 0 | | **87%** |
| number of groups | Aug. 25 | 0 | 2 | 12 | 1 | 6 | 1 | **22** | |
| number of animals | Aug. 25 | 0 | 2 | 30 | 1 | 9 | 2 | **44** | |
| **time of survey** | | **17:36-19:00** | **16:21-17:35** | **15:04-16:20** | **14:07-15:03** | **13:06-14:06** | **12:00-13:05** | | |
| visibility in km | Aug. 31 | 10 | 10 | 10 | 10 | 10 | 10 | | |
| sea state in points | Aug. 31 | 2-3 | 3 | 3 | 3 | 3 | 2- | | **87%** |
| number of groups | Aug. 31 | 2 | 9 | 8 | 3 | 6 | 7 | **35** | |
| number of animals | Aug. 31 | 3 | 9 | 14 | 3 | 7 | 11 | **47** | |
| **time of survey** | | **8:00-8:10** | **8:11-9:40** | **9:41-13:23** | **13:24-15:59** | **16:00-17:00** | **17:01-18:00** | | |
| visibility in km | Sept. 1 | 10 | 10 | 10 | 10 | 10 | 10 | | |
| sea state in points | Sept. 1 | 1 | 1 | 1-2 | 2 | 2 | 3 | | **80%** |
| number of groups | Sept. 1 | 0 | 5 | 6 | 1 | 15 | 1 | **28** | |
| number of animals | Sept. 1 | 0 | 7 | 9 | 1 | 27 | 1 | **45** | |
| **time of survey** | | **19:44-20:00** | **18:33-19:43** | **17:01-18:32** | **15:22-17:00** | **14:36-15:21** | **13:25-14:35** | | |
| visibility in km | Sept. 12 | 10 | 10 | 10 | 10 | 10 | 10 | | |
| sea state in points | Sept. 12 | 0.5 | 1-0.5 | 1 | 2 | 2-3 | 3 | | **98%** |
| number of groups | Sept. 12 | 0 | 5 | 8 | 9 | 9 | 0 | **31** | |
| number of animals | Sept. 12 | 0 | 9 | 11 | 11 | 10 | 0 | **41** | |
| **time of survey** | | | | **11:00-12:00** | **12:01-13:30** | **13:31-18:05** | **18:06-19:10** | | |
| visibility in km | Sept. 18 | | | 10 | 10 | 10 | 10 | | |
| sea state in points | Sept. 18 | | | 1 | 1 | 2 | 1 | | **47%** |
| number of groups | Sept. 18 | | | 1 | 3 | 8 | 4 | **16** | |
| number of animals | Sept. 18 | | | 1 | 4 | 13 | 6 | **24** | |

Table 2. Results of dedicated vessel-based surveys of western gray whales in the Offshore feeding area from August-September, 2003.

| Coordinates | Transect No. | Date and time of survey | Visibility in km | Sea state in points | Number of groups | Number of animals |
|---|---|---|---|---|---|---|
| **N** | | **Aug. 8** | | | | |
| 52° 26′ | 1 | | | | | |
| 52° 22.5′ | 2 | fog | | | | |
| 52° 19′ | 3 | fog | | | | |
| 52° 15.5′ | 4 | fog | | | | |
| 52° 12′ | 5 | 15:55-16:35 | 10 | 3 | 1 | 2 |
| 52° 8.5′ | 6 | 14:42-15:37 | 10 | 2 | 0 | 0 |
| 52° 5′ | 7 | 11:46-14:15 | 0.3-6 | 2 | 0 | 0 |
| 52° 1.5′ | 8 | 10:34-11:27 | 10 | 1 | 6 | 12 |
| 51° 58′ | 9 | 9:11-10:12 | 10 | 1 | 5 | 10 |
| 51° 54.5′ | 10 | 7:35-8:44 | 10 | 1 | 3 | 4 |
| 51° 51′ | 11 | fog | | | | |
| **Part of area surveyed** | | **50%** | | **Total** | **15** | **28** |
| | | **Aug. 14** | | | | |
| 52° 26′ | 1 | 6:25-7:22 | 8 | 0.5 | 0 | 0 |
| 52° 22.5′ | 2 | 7:39-8:35 | 8-10 | 0.5 | 0 | 0 |
| 52° 19′ | 3 | 8:00-9:55 | 4-6 | 0.5 | 1 | 3 |
| 52° 15.5′ | 4 | 10:15-11:06 | 8 | 0.5-1 | 3 | 4 |
| 52° 12′ | 5 | 11:30-12:27 | 8 | 1 | 0 | 0 |
| 52° 8.5′ | 6 | 12:51-13:46 | 8 | 1 | 3 | 5 |
| 52° 5′ | 7 | 14:04-15:00 | 8 | 1 | 8 | 12 |
| 52° 1.5′ | 8 | 15:22-16:13 | 8-10 | 1 | 7 | 16 |
| 51° 58′ | 9 | 16:40-17:39 | 10 | 1-2 | 5 | 8 |
| 51° 54.5′ | 10 | 18:05-19:00 | 10 | 2 | 0 | 0 |
| 51° 51′ | 11 | 19:26-20:28 | 10 | 1 | 0 | 0 |
| **Part of area surveyed** | | **90%** | | **Total** | **27** | **48** |
| | | **Aug. 26** | | | | |
| 52° 26′ | 1 | 6:43-7:41 | 10 | 1 | 0 | 0 |
| 52° 22.5′ | 2 | 8:01-8:53 | 6-10 | 1 | 0 | 0 |
| 52° 19′ | 3 | 9:16-10:12 | 1-4 | 0.5 | 0 | 0 |
| 52° 15.5′ | 4 | 10:32-11:26 | 6 | 0.5 | 0 | 0 |
| 52° 12′ | 5 | 11:51-12:45 | 6-8 | 0 | 2 | 6 |
| 52° 8.5′ | 6 | 13:00-15:18 | 10 | 0-1 | 2 | 8 |
| 52° 5′ | 7 | 15:36-16:36 | 10 | 1 | 4 | 8 |
| 52° 1.5′ | 8 | 16:50-18:00 | 8-10 | 1-2 | 0 | 0 |
| 51° 58′ | 9 | 18:20-19:09 | 8-10 | 1-3 | 1 | 1 |
| 51° 54.5′ | 10 | | | | | |
| 51° 51′ | 11 | | | | | |
| **Part of area surveyed** | | **80%** | | **Total** | **9** | **23** |

Table 3. Size ratio of gray whale groups observed on the northeastern Sakhalin shelf in July - September, 2003.

| **Number of animals in a group** | **Sightings** | | | | **Feeding Area** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Piltun area** | | | | **Offshore area** | | |
| | July n=11 | Aug. n=251 | Sept. n=210 | Total n=472 | July n=11 | Aug. n=131 | Sept. n=127 | Total n=269 | Aug. n=120 | Sept. n=83 | Total n=203 |
| | % | % | % | % | % | % | % | % | % | % | % |
| 1 | 90.9 | 55.3 | 59.5 | 54.4 | 90.9 | 50.4 | 59.8 | 56.5 | 46.7 | 59 | 51.7 |
| 2 | 9.1 | 33.8 | 33.8 | 33.3 | 9.1 | 36.6 | 33.9 | 34.2 | 30.8 | 33.7 | 32.0 |
| 3 | | 11.5 | 5.7 | 8.7 | | 7.6 | 4.7 | 5.9 | 15.8 | 7.3 | 12.3 |
| 4 | | 3.9 | 4.7 | 2.3 | | 3.0 | 0.8 | 1.1 | 5.0 | | 3.0 |
| 5 | | 1.1 | 4.7 | 0.9 | | 1.5 | 0.8 | 1.1 | 0.8 | | 0.5 |
| 6 | | 0.3 | | 0.2 | | | | | 0.8 | | 0.5 |
| 7 | | 0.3 | | 0.2 | | 0.8 | | 0.4 | | | |
| 8 | | | | | | | | | | | |

Table 4. Number of gray whales observed during dedicated vessel surveys in the Piltun and Offshore feeding areas off northeastern Sakhalin Island, 2001-2003.

| **Area** | Survey data | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2001 | | | | | | | 2002 | | | 2003 | | | | | | |
| | 8/11 | 9/11 | 9/12 | 9/13 | 9/14 | 9/16 | 9/17 | 9/6 | 9/7 | 8/13 | 8/14 | 8/15 | 8/25 | 8/31 | 9/1 | 9/12 | 9/18 |
| Piltun | 26 | 33 | 40 | 30 | | 29 | | | 28 | 31 | | 40 | 44 | 47 | 45 | 41 | 24 |
| Offshore | | | | | 81 | | 83 | 50 | | | 48 | | | | | | |

Table 5. Frequency of sightings of gray whales from non-systematic vessel surveys in the Offshore feeding area in September 2001-2003**.** A. 10, 12 and 14-18 September 2001 B. 6, 12 and 14-18 September 2002 C. 5-9 and 13 September 2003.

A

| **Boundaries of area** | 143° 30′<br>143° 34′ | 143° 35′<br>143° 39′ | 143° 40′<br>143° 44′ |
|---|---|---|---|
| 52° 29′ - 52° 25′ | | | |
| 52° 24′ - 52° 20′ | | 28 | 2 |
| 52° 19′ - 52° 15′ | 1 | 42 | 16 |
| 52° 14′ - 52° 10′ | 11 | 60 | 18 |
| 52° 09′ - 52° 05′ | 39 | 51 | |
| 52° 04′ - 52° 00′ | | | 4 |
| 51° 59′ - 51° 55′ | | | |

B

| **Boundaries of area** | 143° 30′<br>143° 34′ | 143° 35′<br>143° 39′ | 143° 40′<br>143° 44′ |
|---|---|---|---|
| 52° 29′ - 52° 25′ | | 1 | 4 |
| 52° 24′ - 52° 20′ | | 10 | 15 |
| 52° 19′ - 52° 15′ | | 10 | 25 |
| 52° 14′ - 52° 10′ | 6 | 37 | 12 |
| 52° 09′ - 52° 05′ | 3 | 10 | |
| 52° 04′ - 52° 00′ | | | |
| 51° 59′ - 51° 55′ | | | |

C

| **Boundaries of area** | 143° 30′<br>143° 34′ | 143° 35′<br>143° 39′ | 143° 40′<br>143° 44′ | 143° 45′<br>143° 49′ | 143° 50′<br>143° 54′ |
|---|---|---|---|---|---|
| 52° 29′ - 52° 25′ | | | | | |
| 52° 24′ - 52° 20′ | | 1 | 1 | | |
| 52° 19′ - 52° 15′ | | 1 | 6 | 2 | 7 |
| 52° 14′ - 52° 10′ | | 1 | 10 | 32 | 3 |
| 52° 09′ - 52° 05′ | 2 | 12 | 3 | 6 | |
| 52° 04′ - 52° 00′ | 5 | 8 | | | |
| 51° 59′ - 51° 55′ | 8 | | | | |

Table 6. Size of various cetacean groups observed on the northeastern Sakhalin shelf, 2003.

| Frequency of sightings | | Number of animals | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Species** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | **Total** |
| | Killer whale | 2 | 2 | 4 | 2 | | | | 1 | | | | 11 |
| | Harbor porpoise | 5 | 1 | 6 | 5 | 2 | 1 | | 1 | | | 1 | 22 |

APPENDICES

Appendix 1. Locations of marine mammals observed during vessel-based observations July-September 2003.

| Date, day/month | Time | | Coordinates | | Course | Number of animals | Direction, hrs | Species | Distance, m | Sea state, points | Visibility, km |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hrs | Min | North | East | | | | | | | |
| Cetaceans | | | | | | | | | | | |
| Gray Whale | | | | | | | | | | | |
| 27.7 | 10 | 0 | 53,4335 | 143,1845 | 130 | 1 | 5 | GW | 2000 | 3 | 4 |
| 27.7 | 13 | 45 | 53,3312 | 143,2305 | 170 | 1 | 4 | GW | 500 | 4 | 10 |
| 27.7 | 13 | 56 | 53,3072 | 143,2420 | 170 | 1 | 3 | GW | 800 | 4 | 10 |
| 27.7 | 14 | 10 | 53,2748 | 143,2574 | 165 | 1 | | GW | 700 | 4 | 10 |
| 27.7 | 15 | 0 | 53,2747 | 143,2562 | 86 | 1 | 2 | GW | 200 | 4 | 10 |
| 27.7 | 15 | 35 | 53,2745 | 143,2566 | 65 | 1 | 1 | GW | 150 | 4 | 2 |
| 27.7 | 18 | 0 | 53,2746 | 143,2570 | 25 | 1 | 1 | GW | 200 | 4 | 0,2 |
| 29.7 | 7 | 0 | 53,3932 | 143,1955 | 88 | 2 | 2 | GW | 400 | 1 | 3 |
| 29.7 | 8 | 0 | 53,3833 | 143,1833 | 155 | 1 | 4 | GW | 500 | 1 | 3 |
| 30.7 | 14 | 0 | 53,0000 | 143,3333 | 35 | | | GW | | 0,5 | 0,1 |
| 2.8 | 9 | 30 | 52,7385 | 143,3999 | 41 | | | GW | | 0,5 | 0,1 |
| 2.8 | 15 | 45 | 52,8362 | 143,3724 | 180 | 1 | 7 | GW | 500 | 0,5 | 2 |
| 2.8 | 16 | 20 | 52,8656 | 143,3557 | 10 | 2 | 7 | GW | 70 | 0,5 | 0,5 |
| 2.8 | 16 | 30 | 52,8829 | 143,3597 | 10 | 1 | 11 | GW | 100 | 0,5 | 0,5 |
| 2.8 | 16 | 33 | 52,8928 | 143,3616 | 10 | 2 | 5 | GW | 200 | 0,5 | 0,5 |
| 2.8 | 16 | 33 | 52,8928 | 143,3616 | 10 | 1 | 5 | GW | 50 | 0,5 | 0,5 |
| 2.8 | 17 | 10 | 52,9664 | 143,3524 | 83 | 2 | 11 | GW | 100 | 0,5 | 0,5 |
| 2.8 | 17 | 10 | 52,9664 | 143,3524 | 83 | 4 | 5 | GW | 200 | 0,5 | 0,5 |
| 5.8 | 14 | 50 | 52,7087 | 143,3558 | 185 | 1 | 3 | GW | 100 | 0,5 | 1 |
| 6.8 | 14 | 40 | 52,2163 | 143,6967 | 225 | 3 | 2 | GW | 500 | 2 | 10 |
| 6.8 | 16 | 10 | 52,1522 | 143,7151 | 114 | 2 | 10 | GW | 1000 | 2 | 4 |
| 6.8 | 16 | 10 | 52,1522 | 143,7151 | 114 | 1 | 8 | GW | 400 | 2 | 4 |
| 6.8 | 16 | 18 | 52,1452 | 143,7408 | 114 | 3 | 9 | GW | 400 | 2 | 4 |
| 6.8 | 17 | 0 | 52,1268 | 143,7296 | 223 | 3 | 5 | GW | 200 | 2 | 0,5 |
| 7.8 | 9 | 33 | 52,1081 | 143,6793 | 70 | 1 | 9 | GW | 300 | 0 | 0,6 |
| 7.8 | 10 | 0 | 52,1181 | 143,7236 | 50 | 2 | 12 | GW | 300 | 0 | 4 |
| 7.8 | 10 | 0 | 52,1181 | 143,7236 | 50 | 1 | 10 | GW | 300 | 0 | 4 |
| 7.8 | 13 | 0 | 52,0629 | 143,6064 | 290 | 2 | 3 | GW | 400 | 0 | 10 |
| 7.8 | 13 | 0 | 52,0629 | 143,6064 | 290 | 1 | 11 | GW | 400 | 0 | 10 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7.8 | 13 | 35 | 52,0551 | 143,5943 | 200 | 2 | 12 | GW | 300 | 0 | 10 |
| 7.8 | 14 | 0 | 52,0426 | 143,5919 | 180 | 2 | 5 | GW | 700 | 0 | 10 |
| 7.8 | 14 | 23 | 52,0366 | 143,5988 | 160 | 2 | 9 | GW | 1500 | 0 | 10 |
| 7.8 | 14 | 23 | 52,0366 | 143,5988 | 160 | 1 | 7 | GW | 900 | 0 | 10 |
| 7.8 | 14 | 35 | 52,0654 | 143,6119 | 330 | 3 | 11 | GW | 2000 | 0 | 10 |
| 7.8 | 16 | 0 | 52,1527 | 143,6540 | 10 | 2 | 10 | GW | 1000 | 0 | 10 |
| 7.8 | 16 | 0 | 52,1527 | 143,6540 | 10 | 1 | 7 | GW | 1000 | 0 | 10 |
| 7.8 | 18 | 28 | 52,1477 | 143,5516 | 190 | 3 | 12 | GW | 6000 | 0 | 10 |
| 7.8 | 19 | 25 | 52,1207 | 143,5308 | 190 | 1 | 12 | GW | 2000 | 0 | 6 |
| 8.8 | 6 | 10 | 52,1300 | 143,5527 | 90 | 3 | 9 | GW | 800 | 1 | 6 |
| 8.8 | 6 | 20 | 52,1292 | 143,5888 | 90 | 2 | 3 | GW | 900 | 1 | 6 |
| 8.8 | 6 | 20 | 52,1292 | 143,5888 | 90 | 1 | 9 | GW | 2000 | 1 | 6 |
| 8.8 | 6 | 25 | 52,1289 | 143,6192 | 90 | 1 | 3 | GW | 2000 | 1 | 6 |
| 8.8 | 6 | 51 | 52,1084 | 143,6684 | 180 | 1 | 3 | GW | 400 | 1 | 6 |
| 8.8 | 6 | 55 | 52,0886 | 143,6683 | 183 | 2 | 3 | GW | 2000 | 1 | 6 |
| 8.8 | 6 | 53 | 52,0886 | 143,6683 | 183 | 2 | 3 | GW | 1000 | 1 | 6 |
| 8.8 | 7 | 0 | 52,0535 | 143,6671 | 183 | 1 | 3 | GW | 400 | 1 | 6 |
| 8.8 | 7 | 20 | 52,0004 | 143,6671 | 183 | 4 | 3 | GW | 700 | 1 | 10 |
| 8.8 | 7 | 20 | 52,0004 | 143,6671 | 183 | 1 | 3 | GW | 200 | 1 | 10 |
| 8.8 | 7 | 20 | 52,0004 | 143,6671 | 183 | 1 | 3 | GW | 300 | 1 | 10 |
| 8.8 | 7 | 35 | 51,9740 | 143,7159 | 102 | 1 | 9 | GW | 400 | 1 | 10 |
| 8.8 | 8 | 7 | 51,9644 | 143,6618 | 270 | 2 | 3 | GW | 3000 | 1 | 10 |
| 8.8 | 8 | 7 | 51,9661 | 143,6618 | 270 | 1 | 3 | GW | 1000 | 1 | 10 |
| 8.8 | 9 | 34 | 52,0289 | 143,5815 | 90 | 3 | 9 | GW | 100 | 1 | 10 |
| 8.8 | 9 | 34 | 52,0289 | 143,5815 | 90 | 1 | 3 | GW | 300 | 1 | 10 |
| 8.8 | 9 | 38 | 52,0289 | 143,6073 | 90 | 1 | 9 | GW | 500 | 1 | 10 |
| 8.8 | 9 | 47 | 52,0291 | 143,6487 | 90 | 2 | 3 | GW | 3000 | 1 | 99 |
| 8.8 | 9 | 54 | 52,0291 | 143,6747 | 90 | 3 | 3 | GW | 200 | 1 | 10 |
| 8.8 | 11 | 9 | 52,0883 | 143,5864 | 270 | 3 | 9 | GW | 500 | 1 | 10 |
| 8.8 | 11 | 17 | 52,0883 | 143,5463 | 270 | 1 | 9 | GW | 400 | 1 | 10 |
| 8.8 | 11 | 17 | 52,0883 | 143,5463 | 270 | 1 | 9 | GW | 3000 | 1 | 10 |
| 8.8 | 11 | 17 | 52,0883 | 143,5463 | 270 | 3 | 3 | GW | 2000 | 1 | 10 |
| 8.8 | 11 | 17 | 52,0883 | 143,5463 | 270 | 2 | 3 | GW | 2000 | 1 | 10 |
| 8.8 | 11 | 22 | 52,0833 | 143,5268 | 270 | 2 | 9 | GW | 3000 | 1 | 10 |
| 8.8 | 16 | 20 | 52,2625 | 143,6163 | 90 | 2 | 3 | GW | 400 | 3 | 10 |
| 9.8 | 13 | 50 | 53,3294 | 143,2404 | 320 | 2 | 9 | GW | 200 | 1 | 8 |
| 9.8 | 14 | 0 | 53,3353 | 143,2402 | 10 | 3 | 9 | GW | 100 | 1 | 8 |
| 9.8 | 15 | 7 | 53,4855 | 143,1723 | 350 | 2 | 9 | GW | 3000 | 1 | 10 |
| 13.8 | 9 | 40 | 53,3632 | 143,2142 | 162 | 2 | 3 | GW | 800 | 0,5 | 6 |
| 13.8 | 10 | 13 | 53,2877 | 143,2482 | 169 | 2 | 3 | GW | 300 | 0,5 | 6 |
| 13.8 | 11 | 22 | 53,1229 | 143,3028 | 171 | 1 | 3 | GW | 700 | 0,5 | 8 |
| 13.8 | 11 | 36 | 53,0923 | 143,3105 | 171 | 2 | 3 | GW | 300 | 0,5 | 6 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.8 | 11 | 36 | 53,0923 | 143,3105 | 171 | 3 | 9 | GW | 500 | 0,5 | 6 |
| 13.8 | 12 | 15 | 53,0553 | 143,3187 | 180 | 1 | 3 | GW | 400 | 0,5 | 6 |
| 13.8 | 12 | 54 | 53,0338 | 143,3201 | 180 | 1 | 9 | GW | 200 | 0,5 | 6 |
| 13.8 | 13 | 0 | 53,0204 | 143,3234 | 180 | 1 | 8 | GW | 1000 | 0,5 | 6 |
| 13.8 | 13 | 7 | 53,0002 | 143,3278 | 180 | 1 | 8 | GW | 500 | 0,5 | 6 |
| 13.8 | 13 | 24 | 52,9610 | 143,3378 | 180 | 1 | 7 | GW | 200 | 0,5 | 6 |
| 13.8 | 13 | 30 | 52,9453 | 143,3436 | 168 | 1 | 9 | GW | 500 | 0,5 | 6 |
| 13.8 | 13 | 37 | 52,9332 | 143,3484 | 168 | 2 | 8 | GW | 300 | 0,5 | 6 |
| 13.8 | 13 | 37 | 52,9332 | 143,3484 | 168 | 1 | 7 | GW | 100 | 0,5 | 6 |
| 13.8 | 14 | 10 | 52,9009 | 143,3593 | 168 | 2 | 3 | GW | 1500 | 0,5 | 6 |
| 13.8 | 14 | 20 | 52,8514 | 143,3718 | 168 | 2 | 3 | GW | 2500 | 0,5 | 6 |
| 13.8 | 14 | 20 | 52,8514 | 143,3718 | 168 | 1 | 3 | GW | 800 | 0,5 | 6 |
| 13.8 | 14 | 20 | 52,8514 | 143,3718 | 168 | 1 | 4 | GW | 1000 | 0,5 | 6 |
| 13.8 | 14 | 40 | 52,8392 | 143,3739 | 184 | 2 | 3 | GW | 500 | 0,5 | 6 |
| 13.8 | 14 | 44 | 52,8171 | 143,3710 | 196 | 2 | 9 | GW | 30 | 0,5 | 6 |
| 13.8 | 15 | 34 | 52,7094 | 143,3502 | 184 | 2 | 3 | GW | 1000 | 0,5 | 8 |
| 13.8 | 20 | 24 | 52,3172 | 143,5970 | 178 | 1 | 3 | GW | 1500 | 0,5 | 10 |
| 14.8 | 9 | 47 | 52,3153 | 143,7178 | 90 | 3 | 3 | GW | 2000 | 0,5 | 6 |
| 14.8 | 10 | 25 | 52,2609 | 143,7076 | 270 | 2 | 3 | GW | 2000 | 0 | 8 |
| 14.8 | 10 | 30 | 52,2609 | 143,6708 | 270 | 1 | 3 | GW | 1500 | 1 | 8 |
| 14.8 | 11 | 0 | 52,2610 | 143,5319 | 270 | 1 | 9 | GW | 300 | 1 | 8 |
| 14.8 | 12 | 50 | 52,1404 | 143,7491 | 180 | 1 | 3 | GW | 3000 | 1 | 8 |
| 14.8 | 13 | 0 | 52,1399 | 143,7147 | 270 | 1 | 3 | GW | 150 | 1 | 8 |
| 14.8 | 13 | 0 | 52,1399 | 143,7147 | 270 | 3 | 9 | GW | 2500 | 1 | 8 |
| 14.8 | 14 | 22 | 52,0868 | 143,5869 | 90 | 1 | 3 | GW | 2000 | 1 | 8 |
| 14.8 | 14 | 22 | 52,0868 | 143,5869 | 90 | 1 | 9 | GW | 3000 | 1 | 8 |
| 14.8 | 14 | 30 | 52,0868 | 143,6183 | 90 | 2 | 3 | GW | 2000 | 1 | 8 |
| 14.8 | 14 | 36 | 52,0868 | 143,6317 | 90 | 1 | 9 | GW | 1500 | 1 | 8 |
| 14.8 | 14 | 46 | 52,0868 | 143,6893 | 90 | 2 | 3 | GW | 1000 | 1 | 8 |
| 14.8 | 14 | 46 | 52,0868 | 143,6893 | 90 | 1 | 3 | GW | 2000 | 1 | 8 |
| 14.8 | 14 | 50 | 52,0868 | 143,7363 | 90 | 2 | 9 | GW | 3000 | 1 | 8 |
| 14.8 | 15 | 10 | 52,0567 | 143,7495 | 180 | 2 | 3 | GW | 3000 | 1 | 8 |
| 14.8 | 15 | 46 | 52,0277 | 143,6388 | 270 | 1 | 3 | GW | 3500 | 1 | 8 |
| 14.8 | 15 | 50 | 52,0277 | 143,6177 | 270 | 3 | 3 | GW | 3000 | 1 | 8 |
| 14.8 | 16 | 0 | 52,0284 | 143,5714 | 271 | 1 | 3 | GW | 2000 | 1 | 8 |
| 14.8 | 16 | 4 | 52,0284 | 143,5534 | 270 | 3 | 9 | GW | 1500 | 1 | 8 |
| 14.8 | 16 | 4 | 52,0284 | 143,5534 | 270 | 1 | 9 | GW | 1000 | 1 | 8 |
| 14.8 | 16 | 24 | 52,0105 | 143,4962 | 180 | 2 | 9 | GW | 1000 | 1 | 8 |
| 14.8 | 16 | 30 | 51,9935 | 143,4962 | 180 | 5 | 9 | GW | 1500 | 1 | 8 |
| 14.8 | 16 | 36 | 51,9774 | 143,4962 | 180 | 1 | 9 | GW | 800 | 1 | 8 |
| 14.8 | 16 | 36 | 51,9774 | 143,4962 | 180 | 2 | 9 | GW | 1500 | 1 | 8 |
| 14.8 | 16 | 36 | 51,9774 | 143,4962 | 180 | 2 | 9 | GW | 700 | 1 | 8 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 14.8 | 16 | 40 | 51,9665 | 143,4988 | 180 | 1 | 9 | GW | 400 | 2 | 10 |
| 14.8 | 17 | 0 | 51,9700 | 143,5570 | 90 | 2 | 3 | GW | 1500 | 2 | 10 |
| 15.8 | 13 | 0 | 52,9075 | 143,3546 | 95 | 1 | 9 | GW | 800 | 0,5 | 2 |
| 15.8 | 13 | 0 | 52,9075 | 143,3546 | 95 | 2 | 10 | GW | 900 | 0,5 | 2 |
| 15.8 | 13 | 50 | 52,8530 | 143,3640 | 180 | 1 | 3 | GW | 800 | 0,5 | 2 |
| 15.8 | 13 | 55 | 52,8462 | 143,3604 | 180 | 1 | 9 | GW | 100 | 0,5 | 0,5 |
| 15.8 | 14 | 0 | 52,8575 | 143,3517 | 340 | 2 | 3 | GW | 200 | 0,5 | 1 |
| 15.8 | 14 | 25 | 52,9292 | 143,3460 | 330 | 3 | 3 | GW | 400 | 0,5 | 2 |
| 15.8 | 14 | 25 | 52,9292 | 143,3460 | 330 | 2 | 9 | GW | 300 | 0,5 | 2 |
| 15.8 | 14 | 37 | 52,9659 | 143,3345 | 360 | 2 | 3 | GW | 600 | 0,5 | 2 |
| 15.8 | 14 | 42 | 52,9721 | 143,3331 | 360 | 1 | 9 | GW | 500 | 0,5 | 2 |
| 15.8 | 14 | 46 | 52,9852 | 143,3324 | 360 | 1 | 9 | GW | 300 | 0,5 | 2 |
| 15.8 | 14 | 53 | 53,0048 | 143,3245 | 350 | 2 | 3 | GW | 300 | 0,5 | 2 |
| 15.8 | 15 | 0 | 53,0347 | 143,3177 | 356 | 2 | 9 | GW | 1500 | 0,5 | 2 |
| 15.8 | 15 | 20 | 53,0848 | 143,3235 | 357 | 2 | 4 | GW | 400 | 0,5 | 2 |
| 15.8 | 15 | 45 | 53,1512 | 143,2911 | 360 | 1 | 3 | GW | 1000 | 0,5 | 2 |
| 15.8 | 16 | 25 | 53,2444 | 143,2594 | | 2 | 3 | GW | 1500 | 0,5 | 2 |
| 15.8 | 16 | 40 | 53,2599 | 143,2542 | 350 | 2 | 3 | GW | 1000 | 0,5 | 2 |
| 15.8 | 17 | 7 | 53,3272 | 143,2297 | 350 | 2 | 9 | GW | 200 | 0,5 | 2 |
| 15.8 | 17 | 15 | 53,3450 | 143,2184 | 355 | 2 | 3 | GW | 300 | 0,5 | 2 |
| 15.8 | 17 | 17 | 53,3495 | 143,2159 | 350 | 2 | 3 | GW | 600 | 0,5 | 2 |
| 15.8 | 17 | 17 | 53,3495 | 143,2159 | 349 | 2 | 9 | GW | 400 | 0,5 | 2 |
| 15.8 | 17 | 25 | 53,3750 | 143,2065 | 353 | 3 | 3 | GW | 800 | 0,5 | 2 |
| 15.8 | 17 | 30 | 53,3819 | 143,2052 | 360 | 1 | 9 | GW | 300 | 0,5 | 2 |
| 15.8 | 17 | 35 | 53,3963 | 143,2016 | 10 | 1 | 3 | GW | 700 | 0,5 | 2 |
| 18.8 | 16 | 20 | 52,0578 | 143,6451 | 70 | 2 | 9 | GW | 4000 | 2 | 10 |
| 18.8 | 16 | 45 | 52,0475 | 143,6009 | 225 | 4 | 9 | GW | 500 | 2 | 10 |
| 18.8 | 18 | 45 | 52,0430 | 143,5723 | 355 | 2 | 9 | GW | 500 | 1 | 10 |
| 18.8 | 19 | 7 | 52,0940 | 143,5631 | 10 | 1 | 9 | GW | 1000 | 1 | 10 |
| 18.8 | 19 | 7 | 52,0940 | 143,5631 | 10 | 1 | 3 | GW | 700 | 1 | 10 |
| 18.8 | 19 | 7 | 52,0940 | 143,5631 | 10 | 2 | 3 | GW | 400 | 1 | 10 |
| 18.8 | 19 | 12 | 52,1151 | 143,5697 | 30 | 3 | 9 | GW | 100 | 1 | 10 |
| 18.8 | 19 | 20 | 52,1237 | 143,5884 | 110 | 2 | 9 | GW | 300 | 2 | 10 |
| 18.8 | 19 | 20 | 52,1237 | 143,5884 | 110 | 2 | 2 | GW | 800 | 2 | 10 |
| 23.8 | 19 | 25 | 53,3267 | 143,2430 | 160 | 2 | 3 | GW | 200 | 2 | 10 |
| 23.8 | 19 | 25 | 53,3267 | 143,2430 | 160 | 1 | 12 | GW | 800 | 2 | 10 |
| 24.8 | 8 | 0 | 53,2640 | 143,2850 | 230 | 2 | 4 | GW | 1800 | 1 | 10 |
| 24.8 | 9 | 0 | 53,2190 | 143,3193 | 105 | 2 | 3 | GW | 150 | 2 | 10 |
| 24.8 | 11 | 0 | 53,1100 | 143,3203 | 130 | 1 | 4 | GW | 200 | 2 | 10 |
| 24.8 | 11 | 0 | 53,1100 | 143,3203 | 130 | 2 | 10 | GW | 2000 | 2 | 10 |
| 24.8 | 11 | 20 | 53,0957 | 143,3223 | 130 | 2 | 12 | GW | 100 | 2 | 10 |
| 24.8 | 16 | 0 | 53,0755 | 143,3172 | 270 | 4 | 10 | GW | 300 | 3 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 24.8 | 17 | 0 | 53,0589 | 143,3209 | 330 | 2 | 8 | GW | 2500 | 3 | 10 |
| 24.8 | 17 | 50 | 52,9897 | 143,3267 | 175 | 1 | 9 | GW | 600 | 3 | 10 |
| 24.8 | 18 | 0 | 52,9578 | 143,3333 | 175 | 1 | 12 | GW | 400 | 3 | 10 |
| 24.8 | 18 | 5 | 52,9339 | 143,3373 | 175 | 3 | 9 | GW | 2000 | 3 | 10 |
| 24.8 | 18 | 5 | 52,9173 | 143,3373 | 175 | 1 | 9 | GW | 500 | 3 | 10 |
| 24.8 | 18 | 5 | 52,9173 | 143,3373 | 175 | 2 | 10 | GW | 300 | 3 | 10 |
| 24.8 | 18 | 15 | 52,9210 | 143,3402 | 175 | 2 | 9 | GW | 400 | 3 | 10 |
| 24.8 | 18 | 20 | 52,9087 | 143,3607 | 80 | 2 | 4 | GW | 400 | 3 | 10 |
| 24.8 | 18 | 20 | 52,9087 | 143,3607 | 80 | 5 | 4 | GW | 2000 | 3 | 10 |
| 24.8 | 20 | 25 | 52,8600 | 143,3533 | 175 | 2 | 9 | GW | 200 | 3 | 8 |
| 24.8 | 20 | 25 | 52,8600 | 143,3533 | 175 | 1 | 3 | GW | 100 | 3 | 8 |
| 24.8 | 20 | 25 | 52,8600 | 143,3533 | 175 | 2 | 3 | GW | 300 | 3 | 8 |
| 24.8 | 20 | 27 | 52,8501 | 143,3558 | 175 | 1 | 2 | GW | 800 | 3 | 6 |
| 24.8 | 20 | 32 | 52,8359 | 143,3583 | 175 | 1 | 3 | GW | 300 | 2 | 6 |
| 24.8 | 20 | 32 | 52,8359 | 143,3583 | 175 | 1 | 3 | GW | 1500 | 2 | 5 |
| 24.8 | 20 | 35 | 52,8265 | 143,3580 | 175 | 1 | 9 | GW | 400 | 2 | 3 |
| 24.8 | 20 | 37 | 52,8210 | 143,3567 | 180 | 2 | 9 | GW | 200 | 2 | 3 |
| 24.8 | 20 | 39 | 52,8115 | 143,3577 | 180 | 3 | 3 | GW | 1500 | 2 | 3 |
| 25.8 | 8 | 0 | 52,7634 | 143,3528 | 0 | 1 | 3 | GW | 500 | 1 | 10 |
| 25.8 | 8 | 3 | 52,7903 | 143,3551 | 0 | 1 | 9 | GW | 300 | 1 | 10 |
| 25.8 | 8 | 35 | 52,8420 | 143,3695 | 0 | 2 | 10 | GW | 2000 | 1 | 10 |
| 25.8 | 8 | 35 | 52,8420 | 143,3695 | 0 | 2 | 1 | GW | 1000 | 1 | 10 |
| 25.8 | 8 | 35 | 52,8420 | 143,3695 | 0 | 2 | 2 | GW | 800 | 1 | 10 |
| 25.8 | 9 | 0 | 52,8593 | 143,3730 | 350 | 3 | 10 | GW | 2200 | 1 | 10 |
| 25.8 | 9 | 44 | 52,8911 | 143,3510 | 0 | 1 | 9 | GW | 2000 | 1 | 10 |
| 25.8 | 10 | 0 | 52,9054 | 143,3503 | 0 | 1 | 9 | GW | 2000 | 1 | 10 |
| 25.8 | 10 | 0 | 52,9054 | 143,3503 | 0 | 7 | 12 | GW | 400 | 1 | 10 |
| 25.8 | 10 | 0 | 52,9054 | 143,3503 | 0 | 3 | 2 | GW | 3000 | 0 | 10 |
| 25.8 | 10 | 25 | 52,9253 | 143,3524 | 0 | 3 | 9 | GW | 2000 | 0 | 10 |
| 25.8 | 10 | 43 | 52,9595 | 143,3407 | 0 | 1 | 9 | GW | 1800 | 0 | 10 |
| 25.8 | 10 | 50 | 52,9727 | 143,3371 | 0 | 1 | 9 | GW | 400 | 1 | 10 |
| 25.8 | 11 | 0 | 52,9938 | 143,3342 | 0 | 2 | 3 | GW | 500 | 1 | 10 |
| 25.8 | 13 | 34 | 53,1028 | 143,3279 | 330 | 1 | 9 | GW | 600 | 0 | 10 |
| 25.8 | 14 | 52 | 53,2797 | 143,2534 | 340 | 1 | 9 | GW | 200 | 1 | 10 |
| 25.8 | 15 | 0 | 53,3036 | 143,2390 | 340 | 1 | 8 | GW | 300 | 1 | 10 |
| 25.8 | 16 | 35 | 53,3303 | 143,2369 | 330 | 3 | 9 | GW | 100 | 1 | 10 |
| 25.8 | 16 | 35 | 53,3303 | 143,2369 | 330 | 1 | 9 | GW | 500 | 1 | 10 |
| 25.8 | 16 | 35 | 53,3303 | 143,2369 | 330 | 2 | 3 | GW | 1000 | 1 | 10 |
| 25.8 | 16 | 35 | 53,3303 | 143,2369 | 330 | 1 | 5 | GW | 700 | 1 | 10 |
| 25.8 | 18 | 15 | 53,3914 | 143,1968 | 320 | 2 | 12 | GW | 200 | 0 | 10 |
| 26.8 | 12 | 46 | 52,2020 | 143,7515 | 180 | 4 | 9 | GW | 2000 | 0 | 10 |
| 26.8 | 12 | 55 | 52,1907 | 143,7517 | 180 | 2 | 9 | GW | 400 | 0 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 26.8 | 13 | 0 | 52,1412 | 143,7502 | 180 | 1 | 9 | GW | 700 | 0 | 10 |
| 26.8 | 13 | 0 | 52,1412 | 143,7502 | 180 | 6 | 12 | GW | 3000 | 0 | 10 |
| 26.8 | 14 | 22 | 52,1423 | 143,7461 | 200 | 1 | 9 | GW | 4000 | 0 | 10 |
| 26.8 | 15 | 53 | 52,0869 | 143,5621 | 90 | 2 | 9 | GW | 1000 | 1 | 10 |
| 26.8 | 16 | 0 | 52,0869 | 143,6135 | 90 | 1 | 9 | GW | 400 | 1 | 10 |
| 26.8 | 16 | 30 | 52,0882 | 143,7243 | 90 | 1 | 9 | GW | 2500 | 1 | 10 |
| 26.8 | 16 | 35 | 52,0867 | 143,7471 | 90 | 4 | 9 | GW | 3000 | 1 | 10 |
| 26.8 | 18 | 32 | 51,9709 | 143,5590 | 90 | 1 | 9 | GW | 200 | 2 | 8 |
| 27.8 | 9 | 20 | 52,1805 | 143,7187 | 45 | 1 | 12 | GW | 400 | 1 | 10 |
| 27.8 | 11 | 0 | 52,1786 | 143,7658 | 40 | 1 | 12 | GW | 800 | 1 | 10 |
| 27.8 | 13 | 0 | 52,2211 | 143,7786 | 270 | 2 | 3 | GW | 500 | 1 | 10 |
| 27.8 | 13 | 0 | 52,2211 | 143,7786 | 270 | 1 | 2 | GW | 600 | 1 | 10 |
| 27.8 | 13 | 0 | 52,2211 | 143,7786 | 270 | 2 | 3 | GW | 800 | 1 | 10 |
| 27.8 | 13 | 0 | 52,2211 | 143,7786 | 270 | 2 | 1 | GW | 1500 | 1 | 10 |
| 27.8 | 13 | 0 | 52,2211 | 143,7786 | 270 | 3 | 3 | GW | 2000 | 1 | 10 |
| 27.8 | 15 | 15 | 52,2315 | 143,7542 | 248 | 2 | 3 | GW | 1500 | 2 | 8 |
| 27.8 | 15 | 15 | 52,2315 | 143,7542 | 248 | 2 | 8 | GW | 1000 | 2 | 8 |
| 27.8 | 16 | 0 | 52,2510 | 143,7407 | 248 | 1 | 9 | GW | 200 | 2 | 0,5 |
| 28.8 | 9 | 22 | 52,1426 | 143,6073 | 267 | 1 | 9 | GW | 700 | 2 | 10 |
| 28.8 | 9 | 22 | 52,1426 | 143,6073 | 267 | 2 | 12 | GW | 1000 | 2 | 10 |
| 28.8 | 9 | 22 | 52,1426 | 143,6073 | 267 | 1 | 1 | GW | 500 | 2 | 10 |
| 28.8 | 10 | 0 | 52,1226 | 143,5757 | 130 | 1 | 12 | GW | 2000 | 2 | 10 |
| 28.8 | 10 | 0 | 52,1226 | 143,5765 | 130 | 1 | 3 | GW | 300 | 2 | 10 |
| 28.8 | 14 | 0 | 52,1241 | 143,6445 | 110 | 4 | 9 | GW | 800 | 1 | 10 |
| 28.8 | 15 | 50 | 52,1855 | 143,7602 | 260 | 2 | 8 | GW | 1000 | 1 | 10 |
| 28.8 | 15 | 50 | 52,1855 | 143,7602 | 260 | 3 | 6 | GW | 1000 | 1 | 10 |
| 28.8 | 15 | 50 | 52,1855 | 143,7602 | 260 | 1 | 3 | GW | 2500 | 1 | 10 |
| 28.8 | 15 | 50 | 52,1855 | 143,7602 | 260 | 4 | 3 | GW | 1000 | 1 | 10 |
| 28.8 | 16 | 40 | 52,2108 | 143,7776 | 345 | 1 | 2 | GW | 2000 | 1 | 10 |
| 28.8 | 17 | 0 | 52,2235 | 143,7663 | 250 | 3 | 9 | GW | 2000 | 1 | 10 |
| 28.8 | 18 | 0 | 52,2367 | 143,7230 | 160 | 2 | 3 | GW | 800 | 1 | 10 |
| 28.8 | 18 | 30 | 52,2494 | 143,7735 | 80 | 5 | 3 | GW | 500 | 1 | 10 |
| 31.8 | 12 | 36 | 53,4028 | 143,1935 | 190 | 1 | 3 | GW | 800 | 2 | 10 |
| 31.8 | 12 | 54 | 53,3622 | 143,2133 | 180 | 1 | 3 | GW | 600 | 2 | 10 |
| 31.8 | 12 | 54 | 53,3622 | 143,2133 | 180 | 2 | 9 | GW | 3000 | 2 | 10 |
| 31.8 | 12 | 57 | 53,3543 | 143,2196 | 180 | 2 | 3 | GW | 400 | 3 | 10 |
| 31.8 | 13 | 5 | 53,3366 | 143,2349 | 180 | 2 | 3 | GW | 1000 | 3 | 10 |
| 31.8 | 13 | 5 | 53,3366 | 143,2349 | 180 | 2 | 3 | GW | 600 | 3 | 10 |
| 31.8 | 13 | 5 | 53,3366 | 143,2349 | 180 | 1 | 3 | GW | 700 | 3 | 10 |
| 31.8 | 13 | 10 | 53,3117 | 143,2445 | 180 | 1 | 3 | GW | 150 | 3 | 10 |
| 31.8 | 13 | 22 | 53,2927 | 143,2489 | 180 | 2 | 9 | GW | 200 | 3 | 10 |
| 31.8 | 13 | 26 | 53,2674 | 143,2520 | 180 | 1 | 3 | GW | 1000 | 3 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 31.8 | 13 | 34 | 53,2630 | 143,2578 | 180 | 1 | 9 | GW | 3000 | 3 | 10 |
| 31.8 | 13 | 41 | 53,2458 | 143,2667 | 180 | 1 | 3 | GW | 200 | 3 | 10 |
| 31.8 | 13 | 43 | 53,2402 | 143,2693 | 180 | 1 | 9 | GW | 200 | 3 | 10 |
| 31.8 | 14 | 30 | 53,1288 | 143,3005 | 190 | 1 | 9 | GW | 250 | 3 | 10 |
| 31.8 | 14 | 50 | 53,0740 | 143,3122 | 190 | 1 | 9 | GW | 150 | 3 | 10 |
| 31.8 | 15 | 0 | 53,0495 | 143,3171 | 185 | 1 | 9 | GW | 700 | 3 | 10 |
| 31.8 | 15 | 30 | 52,9662 | 143,3330 | 190 | 1 | 9 | GW | 400 | 3 | 10 |
| 31.8 | 15 | 50 | 52,9216 | 143,3415 | 190 | 4 | 3 | GW | 900 | 3 | 10 |
| 31.8 | 15 | 50 | 52,9216 | 143,3415 | 190 | 1 | 3 | GW | 300 | 3 | 10 |
| 31.8 | 16 | 0 | 52,8956 | 143,3490 | 175 | 1 | 3 | GW | 1000 | 3 | 10 |
| 31.8 | 16 | 15 | 52,8615 | 143,3718 | 175 | 1 | 3 | GW | 900 | 3 | 10 |
| 31.8 | 16 | 15 | 52,8550 | 143,3768 | 180 | 2 | 3 | GW | 1000 | 3 | 10 |
| 31.8 | 16 | 16 | 52,8550 | 143,3768 | 180 | 2 | 3 | GW | 700 | 3 | 10 |
| 31.8 | 16 | 20 | 52,8451 | 143,3828 | 180 | 2 | 3 | GW | 800 | 3 | 10 |
| 31.8 | 16 | 30 | 52,8253 | 143,4086 | 160 | 1 | 3 | GW | 1000 | 3 | 10 |
| 31.8 | 16 | 35 | 52,8316 | 143,4114 | 160 | 1 | 3 | GW | 2500 | 3 | 10 |
| 31.8 | 16 | 52 | 52,7769 | 143,3769 | 180 | 1 | 3 | GW | 3000 | 3 | 10 |
| 31.8 | 17 | 15 | 52,7316 | 143,3521 | 180 | 1 | 9 | GW | 600 | 3 | 10 |
| 31.8 | 17 | 15 | 52,7306 | 143,3521 | 180 | 1 | 9 | GW | 200 | 3 | 10 |
| 31.8 | 17 | 18 | 52,7198 | 143,3545 | 180 | 1 | 9 | GW | 500 | 3 | 10 |
| 31.8 | 17 | 30 | 52,6963 | 143,3579 | 210 | 1 | 9 | GW | 300 | 3 | 10 |
| 31.8 | 17 | 35 | 52,6792 | 143,3495 | 200 | 1 | 3 | GW | 150 | 3 | 10 |
| 31.8 | 17 | 35 | 52,6792 | 143,3495 | 200 | 1 | 9 | GW | 700 | 3 | 10 |
| 31.8 | 17 | 48 | 52,6511 | 143,3440 | 200 | 2 | 9 | GW | 400 | 3 | 10 |
| 31.8 | 19 | 0 | 52,6483 | 143,3438 | 210 | 1 | 7 | GW | 1000 | 1 | 10 |
| 1.9 | 9 | 5 | 52,7829 | 143,3587 | 20 | 2 | 9 | GW | 500 | 1 | 10 |
| 1.9 | 9 | 25 | 52,8058 | 143,3510 | 20 | 1 | 3 | GW | 200 | 1 | 10 |
| 1.9 | 9 | 25 | 52,8058 | 143,3510 | 20 | 1 | 3 | GW | 900 | 1 | 10 |
| 1.9 | 9 | 25 | 52,8058 | 143,3510 | 20 | 1 | 9 | GW | 1500 | 1 | 10 |
| 1.9 | 9 | 25 | 52,8058 | 143,3510 | 20 | 2 | 11 | GW | 2000 | 1 | 10 |
| 1.9 | 10 | 20 | 52,8779 | 143,3762 | 16 | 1 | 9 | GW | 500 | 1 | 10 |
| 1.9 | 10 | 20 | 52,8779 | 143,3762 | 16 | 1 | 9 | GW | 1000 | 1 | 10 |
| 1.9 | 10 | 20 | 52,8779 | 143,3762 | 16 | 2 | 9 | GW | 2500 | 1 | 10 |
| 1.9 | 10 | 30 | 52,8887 | 143,3802 | 16 | 2 | 9 | GW | 2500 | 2 | 10 |
| 1.9 | 13 | 0 | 52,9333 | 143,3425 | 0 | 1 | 9 | GW | 1800 | 2 | 10 |
| 1.9 | 13 | 7 | 52,9535 | 143,3401 | 0 | 2 | 9 | GW | 1500 | 2 | 10 |
| 1.9 | 14 | 25 | 53,1475 | 143,2923 | 330 | 1 | 3 | GW | 200 | 2 | 10 |
| 1.9 | 16 | 0 | 53,1742 | 143,2897 | 350 | 1 | 3 | GW | 150 | 2 | 10 |
| 1.9 | 16 | 15 | 53,2045 | 143,2809 | 350 | 1 | 3 | GW | 200 | 2 | 10 |
| 1.9 | 16 | 18 | 53,2142 | 143,2784 | 350 | 4 | 9 | GW | 700 | 2 | 10 |
| 1.9 | 16 | 23 | 53,2202 | 143,2766 | 350 | 2 | 3 | GW | 300 | 2 | 10 |
| 1.9 | 16 | 23 | 53,2202 | 143,2766 | 350 | 1 | 3 | GW | 400 | 2 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.9 | 16 | 30 | 53,2398 | 143,2708 | 350 | 5 | 3 | GW | 3000 | 2 | 10 |
| 1.9 | 16 | 32 | 53,2503 | 143,2677 | 350 | 2 | 9 | GW | 150 | 2 | 10 |
| 1.9 | 16 | 40 | 53,2707 | 143,2615 | 350 | 1 | 3 | GW | 2500 | 2 | 10 |
| 1.9 | 16 | 40 | 53,2707 | 143,2615 | 350 | 1 | 9 | GW | 800 | 2 | 10 |
| 1.9 | 16 | 45 | 53,2784 | 143,2591 | 350 | 2 | 9 | GW | 300 | 2 | 10 |
| 1.9 | 16 | 48 | 53,2888 | 143,2554 | 350 | 2 | 9 | GW | 600 | 2 | 10 |
| 1.9 | 16 | 54 | 53,3023 | 143,2605 | 350 | 2 | 3 | GW | 1000 | 3 | 10 |
| 1.9 | 16 | 54 | 53,3023 | 143,2605 | 350 | 1 | 3 | GW | 400 | 3 | 10 |
| 1.9 | 16 | 54 | 53,3023 | 143,2605 | 350 | 1 | 9 | GW | 700 | 3 | 10 |
| 1.9 | 17 | 0 | 53,3197 | 143,2457 | 350 | 1 | 9 | GW | 900 | 3 | 10 |
| 1.9 | 17 | 15 | 53,3560 | 143,2359 | 350 | 1 | 9 | GW | 700 | 3 | 10 |
| 2.9 | 17 | 30 | 53,3262 | 143,2370 | 290 | 1 | 9 | GW | 400 | 2 | 10 |
| 2.9 | 18 | 30 | 53,3057 | 143,3140 | 60 | 1 | 9 | GW | 700 | 2 | 10 |
| 2.9 | 18 | 50 | 53,2974 | 143,2864 | 110 | 2 | 12 | GW | 300 | 2 | 10 |
| 2.9 | 18 | 50 | 53,2974 | 143,2864 | 110 | 1 | 3 | GW | 400 | 2 | 10 |
| 2.9 | 18 | 50 | 53,2974 | 143,2864 | 110 | 2 | 8 | GW | 700 | 2 | 10 |
| 2.9 | 18 | 50 | 53,2974 | 143,2864 | 110 | 1 | 6 | GW | 500 | 2 | 10 |
| 2.9 | 20 | 0 | 53,2246 | 143,3072 | 190 | 3 | 3 | GW | 2000 | 2 | 10 |
| 3.9 | 9 | 33 | 52,9375 | 143,3832 | 160 | 1 | 3 | GW | 5000 | 1 | 10 |
| 3.9 | 9 | 45 | 52,9121 | 143,3987 | 160 | 2 | 3 | GW | 300 | 1 | 10 |
| 3.9 | 11 | 20 | 52,8913 | 143,3647 | 260 | 2 | 3 | GW | 100 | 1 | 10 |
| 3.9 | 11 | 45 | 52,8877 | 143,3656 | 230 | 2 | 2 | GW | 1500 | 1 | 10 |
| 3.9 | 11 | 45 | 52,8877 | 143,3656 | 230 | 1 | 12 | GW | 2000 | 1 | 10 |
| 3.9 | 11 | 45 | 52,8877 | 143,3656 | 230 | 1 | 11 | GW | 2000 | 1 | 10 |
| 3.9 | 17 | 35 | 52,9654 | 143,3709 | 350 | 1 | 9 | GW | 1500 | 2 | 10 |
| 3.9 | 18 | 43 | 53,1333 | 143,2976 | 350 | 1 | 9 | GW | 200 | 2 | 10 |
| 3.9 | 19 | 32 | 53,2700 | 143,2825 | 350 | 2 | 3 | GW | 300 | 2 | 10 |
| 3.9 | 19 | 42 | 53,2833 | 143,2500 | 350 | 1 | 3 | GW | 700 | 2 | 10 |
| 3.9 | 19 | 48 | 53,3356 | 143,2226 | 350 | 2 | 9 | GW | 500 | 2 | 10 |
| 3.9 | 19 | 48 | 53,3356 | 143,2226 | 350 | 1 | 3 | GW | 300 | 2 | 10 |
| 4.9 | 17 | 15 | 52,9170 | 143,3404 | 170 | 1 | 12 | GW | 400 | 1 | 10 |
| 4.9 | 17 | 21 | 52,9006 | 143,3435 | 170 | 2 | 3 | GW | 900 | 1 | 10 |
| 4.9 | 18 | 0 | 52,9006 | 143,3435 | 20 | 2 | 7 | GW | 900 | 1 | 10 |
| 4.9 | 18 | 0 | 52,9006 | 143,3435 | 20 | 3 | 6 | GW | 2000 | 1 | 10 |
| 4.9 | 18 | 0 | 52,9006 | 143,3435 | 20 | 2 | 8 | GW | 1000 | 1 | 10 |
| 4.9 | 19 | 40 | 52,8179 | 143,3641 | 180 | 2 | 3 | GW | 400 | 0,5 | 10 |
| 4.9 | 19 | 52 | 52,7972 | 143,3609 | 180 | 2 | 9 | GW | 200 | 0,5 | 10 |
| 4.9 | 20 | 0 | 52,7845 | 143,3574 | 180 | 2 | 4 | GW | 1500 | 0,5 | 10 |
| 5.9 | 10 | 40 | 52,2232 | 143,7701 | 140 | 3 | 12 | GW | 600 | 2 | 10 |
| 5.9 | 10 | 40 | 52,2232 | 143,7701 | 140 | 1 | 12 | GW | 700 | 2 | 10 |
| 5.9 | 12 | 0 | 52,2212 | 143,7948 | 250 | 1 | 8 | GW | 1600 | 2 | 10 |
| 5.9 | 13 | 0 | 52,1857 | 143,7844 | 190 | 2 | 12 | GW | 100 | 2 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.9 | 13 | 30 | 52,1557 | 143,7852 | 150 | 2 | 12 | GW | 400 | 2 | 10 |
| 5.9 | 13 | 30 | 52,1557 | 143,7852 | 150 | 1 | 11 | GW | 800 | 2 | 10 |
| 5.9 | 15 | 0 | 52,1715 | 143,7396 | 290 | 1 | 2 | GW | 1500 | 2 | 10 |
| 5.9 | 19 | 0 | 52,2155 | 143,8023 | 190 | 2 | 9 | GW | 2000 | 2 | 10 |
| 5.9 | 19 | 30 | 52,2661 | 143,7184 | 320 | 1 | 3 | GW | 400 | 1 | 10 |
| 5.9 | 19 | 30 | 52,2661 | 143,7184 | 320 | 1 | 2 | GW | 1500 | 1 | 10 |
| 5.9 | 20 | 0 | 52,3105 | 143,6441 | 321 | 1 | 11 | GW | 3000 | 1 | 10 |
| 6.9 | 10 | 43 | 52,3918 | 143,6158 | 105 | 1 | 3 | GW | 2000 | 0,5 | 10 |
| 6.9 | 11 | 30 | 52,2956 | 143,6473 | 200 | 1 | 9 | GW | 3000 | 1 | 10 |
| 6.9 | 11 | 40 | 52,2775 | 143,6370 | 200 | 2 | 9 | GW | 5000 | 1 | 10 |
| 6.9 | 13 | 7 | 52,1068 | 143,6160 | 90 | 2 | 3 | GW | 300 | 1 | 10 |
| 6.9 | 13 | 25 | 52,1385 | 143,6426 | 15 | 1 | 9 | GW | 700 | 1 | 10 |
| 6.9 | 13 | 42 | 52,1557 | 143,6570 | 15 | 1 | 3 | GW | 500 | 1 | 10 |
| 6.9 | 13 | 42 | 52,1557 | 143,6570 | 15 | 1 | 12 | GW | 200 | 1 | 10 |
| 6.9 | 14 | 40 | 52,1842 | 143,6963 | 200 | 2 | 9 | GW | 3000 | 1 | 10 |
| 6.9 | 15 | 0 | 52,1660 | 143,7105 | 45 | 2 | 12 | GW | 2000 | 1 | 10 |
| 6.9 | 17 | 20 | 52,1944 | 143,7265 | 270 | 1 | 9 | GW | 700 | 2 | 10 |
| 6.9 | 17 | 45 | 52,1910 | 143,6467 | 225 | 1 | 9 | GW | 400 | 3 | 10 |
| 7.9 | 10 | 12 | 52,1352 | 143,7413 | 20 | 2 | 3 | GW | 2000 | 4 | 10 |
| 7.9 | 10 | 24 | 52,1623 | 143,7574 | 80 | 1 | 12 | GW | 400 | 4 | 10 |
| 7.9 | 12 | 0 | 52,1958 | 143,7997 | 100 | 3 | 12 | GW | 800 | 4 | 10 |
| 7.9 | 12 | 0 | 52,1958 | 143,7997 | 100 | 2 | 3 | GW | 900 | 4 | 10 |
| 7.9 | 12 | 0 | 52,1958 | 143,7997 | 100 | 1 | 4 | GW | 4000 | 4 | 10 |
| 7.9 | 12 | 0 | 52,1958 | 143,7997 | 100 | 1 | 4 | GW | 1000 | 4 | 10 |
| 7.9 | 12 | 0 | 52,1958 | 143,7997 | 100 | 1 | 5 | GW | 700 | 4 | 10 |
| 7.9 | 12 | 20 | 52,2086 | 143,7920 | 140 | 1 | 11 | GW | 600 | 4 | 10 |
| 7.9 | 13 | 0 | 52,2240 | 143,8184 | 230 | 1 | 3 | GW | 200 | 4 | 10 |
| 7.9 | 14 | 0 | 52,2234 | 143,8193 | 120 | 2 | 6 | GW | 800 | 4 | 10 |
| 7.9 | 14 | 20 | 52,2232 | 143,8234 | 85 | 1 | 8 | GW | 1500 | 3 | 10 |
| 7.9 | 14 | 40 | 52,2413 | 143,8417 | 120 | 3 | 9 | GW | 300 | 3 | 10 |
| 7.9 | 14 | 40 | 52,2413 | 143,8417 | 120 | 1 | 11 | GW | 300 | 3 | 10 |
| 7.9 | 15 | 20 | 52,2641 | 143,8885 | 80 | 3 | 12 | GW | 400 | 3 | 10 |
| 7.9 | 16 | 20 | 52,2769 | 143,9071 | 80 | 2 | 6 | GW | 700 | 2 | 10 |
| 7.9 | 18 | 0 | 52,2494 | 143,8677 | 320 | 2 | 12 | GW | 500 | 3 | 10 |
| 7.9 | 18 | 0 | 52,2494 | 143,8677 | 320 | 3 | 10 | GW | 700 | 3 | 10 |
| 8.9 | 9 | 0 | 52,2158 | 143,7786 | 230 | 1 | 12 | GW | 200 | 3 | 10 |
| 8.9 | 9 | 0 | 52,2158 | 143,7786 | 230 | 2 | 3 | GW | 600 | 3 | 10 |
| 8.9 | 9 | 0 | 52,2158 | 143,7786 | 230 | 2 | 3 | GW | 1500 | 3 | 10 |
| 8.9 | 11 | 0 | 52,2151 | 143,7289 | 290 | 1 | 12 | GW | 400 | 3 | 10 |
| 8.9 | 12 | 0 | 52,2657 | 143,8388 | 90 | 1 | 12 | GW | 600 | 2 | 10 |
| 8.9 | 13 | 40 | 52,2697 | 143,8259 | 270 | 1 | 12 | GW | 800 | 2 | 10 |
| 8.9 | 14 | 0 | 52,2895 | 143,8073 | 50 | 2 | 3 | GW | 3000 | 2 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.9 | 15 | 0 | 52,3061 | 143,8499 | 40 | 1 | 1 | GW | 2000 | 2 | 10 |
| 8.9 | 18 | 54 | 52,2762 | 143,8662 | 210 | 1 | 12 | GW | 500 | 3 | 10 |
| 8.9 | 19 | 0 | 52,3067 | 143,8313 | 325 | 1 | 10 | GW | 3000 | 3 | 10 |
| 8.9 | 19 | 26 | 52,3552 | 143,7772 | 320 | 1 | 10 | GW | 5000 | 3 | 10 |
| 8.9 | 20 | 0 | 52,4117 | 143,7167 | 300 | 1 | 3 | GW | 800 | 3 | 10 |
| 9.9 | 7 | 45 | 52,2198 | 143,6986 | 170 | 1 | 3 | GW | 700 | 1 | 10 |
| 9.9 | 9 | 0 | 52,2218 | 143,7693 | 220 | 1 | 12 | GW | 600 | 1 | 10 |
| 9.9 | 19 | 0 | 52,0947 | 143,5734 | 160 | 2 | 9 | GW | 2000 | 3 | 10 |
| 9.9 | 19 | 17 | 52,0487 | 143,6019 | 160 | 2 | 9 | GW | 600 | 2 | 10 |
| 10.9 | 8 | 0 | 52,0627 | 143,6598 | 280 | 2 | 5 | GW | 600 | 1 | 10 |
| 10.9 | 12 | 15 | 52,1539 | 143,7199 | 70 | 1 | 12 | GW | 400 | 3 | 8 |
| 10.9 | 14 | 0 | 52,1819 | 143,7201 | 45 | 1 | 3 | GW | 200 | 4 | 6 |
| 10.9 | 14 | 37 | 52,2109 | 143,7352 | 50 | 1 | 11 | GW | 700 | 4 | 0,2 |
| 12.9 | 14 | 30 | 53,3232 | 143,2358 | 160 | 1 | 9 | GW | 400 | 3 | 10 |
| 12.9 | 14 | 30 | 53,3232 | 143,2358 | 160 | 2 | 9 | GW | 700 | 3 | 10 |
| 12.9 | 14 | 42 | 53,2885 | 143,2533 | 170 | 1 | 9 | GW | 200 | 3 | 10 |
| 12.9 | 14 | 42 | 53,2885 | 143,2533 | 170 | 1 | 9 | GW | 500 | 3 | 10 |
| 12.9 | 14 | 55 | 53,2576 | 143,2663 | 170 | 1 | 9 | GW | 900 | 3 | 10 |
| 12.9 | 14 | 55 | 53,2576 | 143,2663 | 170 | 1 | 3 | GW | 300 | 3 | 10 |
| 12.9 | 14 | 55 | 53,2576 | 143,2663 | 170 | 1 | 3 | GW | 1000 | 3 | 10 |
| 12.9 | 15 | 0 | 53,2311 | 143,2776 | 165 | 1 | 3 | GW | 200 | 2 | 10 |
| 12.9 | 15 | 15 | 53,2033 | 143,2849 | 165 | 1 | 3 | GW | 500 | 2 | 10 |
| 12.9 | 15 | 22 | 53,1792 | 143,2889 | 180 | 1 | 9 | GW | 300 | 2 | 10 |
| 12.9 | 15 | 22 | 53,1792 | 143,2889 | 180 | 1 | 9 | GW | 800 | 2 | 10 |
| 12.9 | 15 | 30 | 53,1436 | 143,2962 | 180 | 1 | 9 | GW | 700 | 2 | 10 |
| 12.9 | 15 | 35 | 53,1371 | 143,2983 | 180 | 1 | 8 | GW | 300 | 2 | 10 |
| 12.9 | 15 | 45 | 53,1183 | 143,3063 | 175 | 1 | 9 | GW | 100 | 2 | 10 |
| 12.9 | 15 | 56 | 53,0826 | 143,3190 | 180 | 1 | 9 | GW | 100 | 3 | 10 |
| 12.9 | 16 | 0 | 53,0616 | 143,3085 | 220 | 3 | 9 | GW | 2000 | 3 | 10 |
| 12.9 | 16 | 50 | 53,0372 | 143,3186 | 170 | 1 | 9 | GW | 100 | 2 | 10 |
| 12.9 | 17 | 0 | 53,0118 | 143,3231 | 170 | 1 | 9 | GW | 800 | 2 | 10 |
| 12.9 | 17 | 12 | 52,9788 | 143,3292 | 175 | 1 | 3 | GW | 300 | 2 | 10 |
| 12.9 | 17 | 30 | 52,9263 | 143,3412 | 180 | 1 | 9 | GW | 300 | 1 | 10 |
| 12.9 | 17 | 30 | 52,9263 | 143,3412 | 180 | 1 | 3 | GW | 100 | 1 | 10 |
| 12.9 | 17 | 35 | 52,9133 | 143,3409 | 180 | 2 | 3 | GW | 400 | 1 | 10 |
| 12.9 | 17 | 35 | 52,9133 | 143,3409 | 180 | 2 | 3 | GW | 800 | 1 | 10 |
| 12.9 | 17 | 45 | 52,8999 | 143,3345 | 240 | 2 | 9 | GW | 300 | 1 | 10 |
| 12.9 | 18 | 0 | 52,8999 | 143,3342 | 340 | 1 | 7 | GW | 700 | 1 | 10 |
| 12.9 | 18 | 27 | 52,8639 | 143,3497 | 170 | 1 | 3 | GW | 1000 | 1 | 10 |
| 12.9 | 18 | 40 | 52,8293 | 143,3645 | 180 | 2 | 3 | GW | 1000 | 1 | 10 |
| 12.9 | 18 | 44 | 52,8178 | 143,3661 | 180 | 3 | 3 | GW | 500 | 1 | 10 |
| 12.9 | 18 | 47 | 52,8108 | 143,3675 | 180 | 1 | 4 | GW | 100 | 1 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 12.9 | 19 | 0 | 52,7640 | 143,3742 | 190 | 2 | 3 | GW | 300 | 0,5 | 10 |
| 12.9 | 19 | 30 | 52,6929 | 143,3708 | 197 | 1 | 3 | GW | 500 | 0,5 | 10 |
| 13.9 | 8 | 50 | 51,9760 | 143,5904 | 320 | 3 | 12 | GW | 300 | 1 | 10 |
| 13.9 | 9 | 25 | 51,9723 | 143,5706 | 300 | 4 | 9 | GW | 3000 | 1 | 10 |
| 13.9 | 10 | 0 | 51,9666 | 143,5580 | 200 | 1 | 12 | GW | 500 | 1 | 10 |
| 13.9 | 11 | 0 | 51,9722 | 143,5323 | 320 | 1 | 12 | GW | 100 | 0,5 | 10 |
| 13.9 | 13 | 17 | 51,9234 | 143,5700 | 100 | 2 | 12 | GW | 500 | 1 | 10 |
| 13.9 | 14 | 35 | 51,9522 | 143,5566 | 0 | 2 | 12 | GW | 100 | 1 | 10 |
| 13.9 | 16 | 24 | 52,0007 | 143,4937 | 347 | 1 | 5 | GW | 2000 | 3 | 10 |
| 13.9 | 16 | 45 | 52,0324 | 143,5474 | 90 | 1 | 3 | GW | 1500 | 3 | 10 |
| 13.9 | 16 | 45 | 52,0324 | 143,5474 | 90 | 3 | 12 | GW | 700 | 3 | 10 |
| 13.9 | 17 | 7 | 52,0344 | 143,5741 | 60 | 1 | 11 | GW | 800 | 3 | 10 |
| 13.9 | 17 | 26 | 52,0428 | 143,5987 | 20 | 1 | 10 | GW | 700 | 3 | 10 |
| 13.9 | 17 | 50 | 52,0643 | 143,6139 | 30 | 2 | 8 | GW | 800 | 3 | 10 |
| 13.9 | 17 | 50 | 52,0643 | 143,6139 | 30 | 1 | 11 | GW | 1000 | 3 | 10 |
| 13.9 | 19 | 0 | 52,1114 | 143,6061 | 20 | 1 | 9 | GW | 500 | 3 | 10 |
| 13.9 | 19 | 10 | 52,1406 | 143,6203 | 20 | 2 | 3 | GW | 700 | 3 | 10 |
| 13.9 | 19 | 10 | 52,1406 | 143,6203 | 20 | 2 | 3 | GW | 500 | 3 | 10 |
| 13.9 | 20 | 0 | 52,2335 | 143,7374 | 70 | 1 | 9 | GW | 1000 | 4 | 5 |
| 13.9 | 20 | 0 | 52,2335 | 143,7374 | 70 | 1 | 3 | GW | 600 | 4 | 5 |
| 17.9 | 10 | 25 | 52,8956 | 143,3457 | 144 | 1 | 9 | GW | 300 | 4 | 6 |
| 17.9 | 10 | 45 | 52,8708 | 143,3828 | 190 | 1 | 3 | GW | 200 | 4 | 4 |
| 18.9 | 11 | 0 | 52,9159 | 143,3880 | 330 | 1 | 9 | GW | 800 | 1 | 10 |
| 18.9 | 13 | 11 | 53,1275 | 143,3204 | 0 | 1 | 3 | GW | 1000 | 1 | 10 |
| 18.9 | 13 | 30 | 53,1518 | 143,2923 | 200 | 1 | 12 | GW | 1000 | 1 | 10 |
| 18.9 | 13 | 30 | 53,1518 | 143,2923 | 200 | 2 | 7 | GW | 1000 | 1 | 10 |
| 18.9 | 14 | 30 | 53,2560 | 143,2843 | 10 | 2 | 3 | GW | 600 | 1 | 10 |
| 18.9 | 14 | 30 | 53,2560 | 143,2843 | 10 | 2 | 1 | GW | 1000 | 1 | 10 |
| 18.9 | 14 | 30 | 53,2560 | 143,2843 | 10 | 1 | 9 | GW | 200 | 1 | 10 |
| 18.9 | 14 | 30 | 53,2560 | 143,2843 | 10 | 1 | 9 | GW | 400 | 1 | 10 |
| 18.9 | 14 | 30 | 53,2560 | 143,2843 | 10 | 2(1) | 10 | GW | 700 | 1 | 10 |
| 18.9 | 14 | 30 | 53,2560 | 143,2843 | 10 | 1 | 11 | GW | 1500 | 1 | 10 |
| 18.9 | 18 | 0 | 53,3235 | 143,2420 | 330 | 2 | 9 | GW | 700 | 2 | 10 |
| 18.9 | 18 | 5 | 53,3300 | 143,2367 | 330 | 1 | 9 | GW | 800 | 2 | 10 |
| 18.9 | 18 | 15 | 53,3421 | 143,2241 | 330 | 2 | 3 | GW | 100 | 1 | 10 |
| 18.9 | 18 | 30 | 53,3481 | 143,2239 | 330 | 2 | 9 | GW | 1000 | 1 | 10 |
| 18.9 | 18 | 37 | 53,3355 | 143,2288 | 170 | 1 | 9 | GW | 300 | 1 | 10 |
| 18.9 | 18 | 43 | 53,3287 | 143,2312 | 170 | 1 | 9 | GW | 600 | 1 | 10 |
| 19.9 | 9 | 0 | 52,8676 | 143,3607 | 240 | 1 | 2 | GW | 800 | 2 | 10 |
| 19.9 | 9 | 25 | 52,8158 | 143,3621 | 190 | 2 | 3 | GW | 100 | 1 | 10 |
| 19.9 | 9 | 50 | 52,7549 | 143,3613 | 185 | 1 | 9 | GW | 300 | 1 | 10 |
| 19.9 | 10 | 0 | 52,7245 | 143,3608 | 185 | 1 | 9 | GW | 300 | 1 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 19.9 | 10 | 0 | 52,7245 | 143,3608 | 185 | 1 | 3 | GW | 400 | 1 | 10 |
| 19.9 | 10 | 10 | 52,7054 | 143,3600 | 185 | 1 | 9 | GW | 300 | 1 | 10 |
| 19.9 | 15 | 0 | 52,7002 | 143,3660 | 10 | 3 | 3 | GW | 100 | 2 | 10 |
| 19.9 | 16 | 43 | 52,7092 | 143,3517 | 10 | 1 | 9 | GW | 400 | 1 | 10 |
| 19.9 | 17 | 15 | 52,7682 | 143,3544 | 10 | 2 | 3 | GW | 500 | 1 | 10 |
| 19.9 | 17 | 20 | 52,7788 | 143,3550 | 10 | 1 | 3 | GW | 500 | 1 | 10 |
| 19.9 | 17 | 25 | 52,7912 | 143,3555 | 10 | 1 | 9 | GW | 1500 | 1 | 10 |
| 19.9 | 17 | 30 | 52,8043 | 143,3563 | 10 | 2 | 9 | GW | 300 | 1 | 10 |
| 19.9 | 17 | 35 | 52,8160 | 143,3573 | 10 | 1(1) | 8 | GW | 200 | 1 | 10 |
| 19.9 | 17 | 45 | 52,8382 | 143,3594 | 10 | 1(1) | 3 | GW | 700 | 1 | 10 |
| 19.9 | 17 | 55 | 52,8590 | 143,3565 | 10 | 1 | 9 | GW | 1500 | 1 | 10 |
| 19.9 | 18 | 25 | 52,9016 | 143,3462 | 10 | 1 | 5 | GW | 400 | 1 | 10 |
| 19.9 | 19 | 0 | 52,9609 | 143,3332 | 0 | 1 | 9 | GW | 1500 | 0,5 | 10 |
| 19.9 | 19 | 25 | 53,0225 | 143,3188 | 350 | 2 | 3 | GW | 500 | 0,5 | 10 |
| Minke Whale | | | | | | | | | | | |
| 23.7 | 11 | 50 | 44,6523 | 138,1505 | 58 | 1 | 3 | MW | 150 | 1 | 10 |
| 24.7 | 6 | 45 | 45,7182 | 142,2008 | 81 | 1 | 9 | MW | 50 | 1 | 2 |
| 4.8 | 18 | 30 | 52,9271 | 143,4942 | 240 | 1 | 1 | MW | 100 | 0,5 | 0,2 |
| 4.8 | 20 | 0 | 52,9167 | 143,4833 | 220 | 1 | 11 | MW | 70 | 0,5 | 0,1 |
| 7.8 | 6 | 40 | 51,9937 | 143,6804 | 160 | 1 | 9 | MW | 70 | 0 | 10 |
| 7.8 | 16 | 0 | 52,1527 | 143,6540 | 10 | 2 | 10 | MW | 200 | 0 | 10 |
| 7.8 | 17 | 0 | 52,1560 | 143,6016 | 10 | 1 | 9 | MW | 140 | 0 | 10 |
| 8.8 | 6 | 37 | 52,1289 | 143,6638 | 90 | 1 | 9 | MW | 200 | 1 | 6 |
| 8.8 | 9 | 40 | 52,0291 | 143,6186 | 90 | 1 | 9 | MW | 150 | 1 | 10 |
| 8.8 | 11 | 17 | 52,0883 | 143,5463 | 270 | 1 | 9 | MW | 500 | 1 | 10 |
| 8.8 | 13 | 37 | 52,1390 | 143,6125 | 180 | 1 | 11 | MW | 150 | 2 | 2 |
| 9.8 | 14 | 33 | 53,4117 | 143,2009 | 350 | 1 | 11 | MW | 30 | 1 | 8 |
| 9.8 | 15 | 25 | 53,5255 | 143,1558 | 350 | 1 | 3 | MW | 50 | 2 | 10 |
| 19.8 | 9 | 0 | 53,4428 | 143,1982 | 200 | 1 | 1 | MW | 100 | 4 | 5 |
| 24.8 | 10 | 47 | 53,1126 | 143,3139 | 160 | 1 | 3 | MW | 200 | 2 | 10 |
| 25.8 | 13 | 0 | 53,0456 | 143,3269 | 90 | 1 | 9 | MW | 400 | 0 | 4 |
| 25.8 | 14 | 8 | 53,1841 | 143,3003 | 355 | 1 | 9 | MW | 300 | 1 | 10 |
| 25.8 | 16 | 50 | 53,3360 | 143,2316 | 330 | 1 | 4 | MW | 300 | 1 | 10 |
| 1.9 | 13 | 7 | 52,9535 | 143,3401 | 0 | 1 | 9 | MW | 300 | 2 | 10 |
| 3.9 | 9 | 27 | 52,9568 | 143,3701 | 160 | 1 | 3 | MW | 700 | 1 | 10 |
| 3.9 | 18 | 0 | 53,0017 | 143,3495 | 350 | 1 | 9 | MW | 200 | 2 | 10 |
| 3.9 | 18 | 12 | 53,0565 | 143,3318 | 350 | 1 | 3 | MW | 100 | 2 | 10 |
| 3.9 | 18 | 15 | 53,0663 | 143,3274 | 350 | 1 | 11 | MW | 100 | 2 | 10 |
| 4.9 | 12 | 0 | 53,3122 | 143,5693 | 170 | 1 | 3 | MW | 300 | 2 | 10 |
| 4.9 | 12 | 10 | 53,2813 | 143,5866 | 170 | 1 | 12 | MW | 400 | 2 | 10 |
| 4.9 | 12 | 15 | 53,2656 | 143,5913 | 170 | 2 | 6 | MW | 500 | 2 | 10 |
| 4.9 | 12 | 26 | 53,2465 | 143,6030 | 170 | 2 | 3 | MW | 300 | 2 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.9 | 12 | 47 | 53,1656 | 143,6288 | 170 | 1 | 3 | MW | 150 | 1 | 10 |
| 4.9 | 13 | 7 | 53,0891 | 143,6559 | 110 | 1 | 2 | MW | 300 | 1 | 10 |
| 18.9 | 17 | 0 | 53,2762 | 143,2575 | 20 | 1 | 3 | MW | 300 | 2 | 10 |
| 25.9 | 11 | 55 | 46,7001 | 138,5546 | 210 | 1 | 8 | MW | 200 | 1 | 10 |
| 25.9 | 12 | 47 | 46,5677 | 138,4503 | 212 | 1 | 4 | MW | 300 | 1 | 10 |
| 25.9 | 13 | 0 | 46,5505 | 138,4183 | 212 | 1 | 10 | MW | 300 | 1 | 10 |
| 25.9 | 13 | 27 | 46,4839 | 138,3677 | 212 | 1 | 11 | MW | 200 | 0,5 | 10 |
| 25.9 | 13 | 32 | 46,4678 | 138,3669 | 212 | 1 | 9 | MW | 300 | 0,5 | 10 |
| 25.9 | 14 | 47 | 46,3008 | 138,2172 | 212 | 1 | 3 | MW | 500 | 1 | 10 |
| 26.9 | 9 | 40 | 43,8678 | 135,6845 | 220 | 1 | 3 | MW | 200 | 1 | 10 |
| 26.9 | 10 | 20 | 43,8516 | 135,6682 | 190 | 1 | 12 | MW | 5 | 1 | 10 |
| 26.9 | 13 | 30 | 43,7015 | 135,5009 | 200 | 1 | 8 | MW | 400 | 2 | 10 |
| Killer Whale | | | | | | | | | | | |
| 25.7 | 15 | 34 | 49,1599 | 144,5985 | 343 | 1 | 5 | KW | 150 | 0 | 10 |
| 31.7 | 14 | 30 | 53,2594 | 143,3233 | 155 | 3 | 5 | KW | 70 | 1 | 0,1 |
| 8.8 | 16 | 30 | 52,2625 | 143,6549 | 90 | 8 | 6 | KW | 500 | 3 | 10 |
| 9.8 | 16 | 33 | 53,6738 | 143,1109 | 355 | 1 | 8 | KW | 100 | 3 | 10 |
| 12.8 | 7 | 10 | 54,2192 | 142,3616 | 185 | 3 | 9 | KW | 1000 | 1 | 10 |
| 18.8 | 10 | 45 | 51,9540 | 143,4452 | 230 | 3 | 8 | KW | 500 | 1 | 10 |
| 25.8 | 6 | 30 | 52,5786 | 143,3509 | 210 | 3 | 3 | KW | 2000 | 2 | 10 |
| 27.8 | 8 | 20 | 52,1230 | 143,6689 | 31 | 4 | 3 | KW | 500 | 1 | 8 |
| 2.9 | 11 | 0 | 53,4420 | 143,2033 | 320 | 3 | 9 | KW | 400 | 2 | 10 |
| 4.9 | 18 | 43 | 52,8786 | 143,3455 | 170 | 2 | 9 | KW | 1000 | 1 | 10 |
| 4.9 | 19 | 52 | 52,7972 | 143,3609 | 180 | 2 | 11 | KW | 300 | 0,5 | 10 |
| 6.9 | 11 | 21 | 52,3298 | 143,6564 | 196 | 4 | 8 | KW | 400 | 1 | 10 |
| 24.9 | 7 | 50 | 50,1012 | 140,7668 | 185 | 1 | 11 | KW | 400 | 2 | 10 |
| White Whale | | | | | | | | | | | |
| 22.9 | 16 | 20 | 52,1834 | 141,5847 | 155 | 2 | 12 | белуха | 150 | 0,5 | 10 |
| 22.9 | 17 | 7 | 52,0347 | 141,5032 | 200 | 6 | 1 | белуха | 500 | 0,2 | 10 |
| Unidentified Whale | | | | | | | | | | | |
| 6.8 | 14 | 15 | 52,2318 | 143,7421 | 240 | 1 | 8 | UW | 2000 | 2 | 6 |
| 24.8 | 12 | 35 | 53,0963 | 143,3360 | 50 | 1 | 6 | UW | 200 | 1 | 10 |
| White-Sided Dolphin | | | | | | | | | | | |
| 8.8 | 11 | 0 | 52,0883 | 143,6462 | 270 | 2 | 3 | DP | 30 | 1 | 10 |
| 29.8 | 17 | 40 | 53,1854 | 143,3688 | 340 | 1 | 7 | DP | 150 | 4 | 4 |
| 26.9 | 14 | 0 | 43,6344 | 135,4350 | 215 | 3 | 7 | DP | 200 | 2 | 10 |
| Harbor Porpoise | | | | | | | | | | | |
| 24.7 | 8 | 34 | 45,7706 | 142,5873 | 74 | 6 | 7 | HP | 1500.5 | | 5 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 24.7 | 18 | 36 | 46,7608 | 143,9902 | 25 | 3 | 9 | HP | 75 | 2 | 10 |
| 27.7 | 10 | 10 | 53,4335 | 143,1845 | 160 | 1 | 11 | HP | 75 | 3 | 2 |
| 27.7 | 15 | 20 | 53,2746 | 143,2566 | 65 | 4 | 9 | HP | 50 | 4 | 2 |
| 7.8 | 6 | 40 | 51,9937 | 143,6804 | 160 | 3 | 11 | HP | 50 | 0 | 10 |
| 7.8 | 11 | 0 | 52,1103 | 143,7108 | 150 | 4 | 1 | HP | 100 | 0 | 4 |
| 7.8 | 13 | 0 | 52,0629 | 143,6064 | 290 | 6 | 11 | HP | 70 | 0 | 10 |
| 7.8 | 16 | 0 | 52,1527 | 143,6540 | 10 | 5 | 7 | HP | 400 | 0 | 10 |
| 8.8 | 9 | 17 | 52,0287 | 143,5225 | 90 | 4 | 9 | HP | 60 | 1 | 10 |
| 8.8 | 9 | 40 | 52,0291 | 143,6186 | 90 | 5 | 3 | HP | 70 | 1 | 10 |
| 8.8 | 16 | 7 | 52,2623 | 143,5518 | 90 | 3 | 9 | HP | 100 | 3 | 10 |
| 13.8 | 13 | 7 | 53,0002 | 143,3278 | 180 | 3 | 9 | HP | 100 | 0,5 | 6 |
| 14.8 | 9 | 30 | 52,3127 | 143,6531 | 90 | 1 | 11 | HP | 40 | 0,5 | 6 |
| 18.8 | 7 | 30 | 52,0335 | 143,4885 | 190 | 1 | 1 | HP | 80 | 1 | 10 |
| 19.8 | 10 | 0 | 53,4428 | 143,1972 | 180 | 1 | 9 | HP | 70 | 4 | 5 |
| 25.8 | 16 | 0 | 53,3006 | 143,2565 | 60 | 2 | 8 | HP | 60 | 1 | 10 |
| 26.8 | 8 | 10 | 52,3745 | 143,7006 | 270 | 3 | 9 | HP | 100 | 1 | 10 |
| 27.8 | 16 | 20 | 52,2528 | 143,7432 | 248 | 1 | 3 | HP | 100 | 2 | 0,2 |
| 31.8 | 17 | 0 | 52,7647 | 143,3569 | 220 | 4 | 3 | HP | 80 | 3 | 10 |
| 3.9 | 12 | 0 | 52,8833 | 143,3644 | 300 | 11 | 9 | HP | 400 | 1 | 10 |
| 12.9 | 18 | 47 | 52,8108 | 143,3675 | 180 | 4 | 3 | HP | 700 | 1 | 10 |
| 12.9 | 19 | 43 | 52,6690 | 143,3668 | 180 | 8 | 8 | HP | 100 | 0,5 | 10 |
| 17.9 | 14 | 30 | 52,8621 | 143,4675 | 220 | 3 | 3 | HP | 50 | 5 | 10 |
| 18.9 | 15 | 0 | 53,2621 | 143,2873 | 20 | 3 | 9 | HP | 200 | 2 | 10 |
| 25.9 | 16 | 0 | 46,1339 | 138,0671 | 212 | 2 | 4 | HP | 400 | 0,5 | 10 |
| 26.9 | 13 | 30 | 43,7015 | 135,5009 | 200 | 2 | 10 | HP | 200 | 2 | 10 |
| Pacific White-Sided Dolphin | | | | | | | | | | | |
| 24.7 | 8 | 20 | 45,7640 | 142,5338 | 74 | 14 | 6 | UO | 400.5 | | 1 |
| 24.7 | 8 | 20 | 45,7640 | 142,5338 | 74 | 8 | 2 | UO | 3000.5 | | 1 |
| 24.7 | 8 | 40 | 45,7743 | 142,6137 | 74 | 9 | 5 | UO | 2500.5 | | 8 |
| 24.7 | 8 | 40 | 45,7792 | 142,6459 | 78 | 12 | 6 | UO | 3000.5 | | 8 |
| 24.7 | 9 | 26 | 45,7988 | 142,7931 | 81 | 6 | 6 | UO | 2000.5 | | 8 |
| Pinnipeds | | | | | | | | | | | |
| Ringed Seal | | | | | | | | | | | |
| 26.7 | 9 | 45 | 51,7521 | 143,3300 | 269 | 1 | 9 | RS | 20 | 1 | 2 |
| 3.8 | 11 | 40 | 53,0947 | 143,3715 | 345 | 3 | 4 | RS | 70 | 0,5 | 0,2 |
| 3.8 | 11 | 55 | 53,1261 | 143,3571 | 347 | 1 | 8 | RS | 50 | 0,5 | 0,2 |
| 3.8 | 13 | 20 | 53,1094 | 143,3735 | 220 | 1 | 8 | RS | 50 | 0,5 | 0,2 |
| 5.8 | 12 | 0 | 52,9075 | 143,3370 | 177 | 1 | 3 | RS | 50 | 0,5 | 0,5 |
| 5.8 | 16 | 35 | 52,4457 | 143,3802 | 167 | 4 | 5 | RS | 50 | 0,5 | 2 |
| 5.8 | 16 | 47 | 52,4229 | 143,3922 | 162 | 7 | 9 | RS | 40 | 0,5 | 4 |
| 5.8 | 17 | 0 | 52,4135 | 143,3930 | 205 | 5 | 8 | RS | 30 | 0,5 | 6 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.8 | 18 | 0 | 52,4140 | 143,3929 | 160 | 3 | 7 | RS | 40 | 0,5 | 6 |
| 7.8 | 6 | 40 | 51,9937 | 143,6804 | 160 | 2 | 3 | RS | 30 | 0 | 10 |
| 7.8 | 7 | 50 | 51,9419 | 143,5544 | 280 | 2 | 9 | RS | 70 | 0 | 0,5 |
| 7.8 | 8 | 33 | 52,0147 | 143,5265 | 50 | 3 | 3 | RS | 30 | 0 | 0,3 |
| 7.8 | 8 | 48 | 52,0435 | 143,5783 | 50 | 1 | 11 | RS | 20 | 0 | 0,3 |
| 7.8 | 9 | 33 | 52,1081 | 143,6793 | 70 | 1 | 9 | RS | 40 | 0 | 0,6 |
| 7.8 | 13 | 0 | 52,0629 | 143,6064 | 290 | 2 | 3 | RS | 30 | 0 | 10 |
| 7.8 | 15 | 0 | 52,0816 | 143,6126 | 330 | 2 | 11 | RS | 50 | 0 | 10 |
| 7.8 | 16 | 0 | 52,1527 | 143,6540 | 10 | 3 | 7 | RS | 50 | 0 | 10 |
| 8.8 | 9 | 34 | 52,0289 | 143,5815 | 90 | 1 | 9 | RS | 100 | 1 | 10 |
| 9.8 | 15 | 0 | 53,4505 | 143,1667 | 350 | 3 | 9 | RS | 50 | 1 | 10 |
| 12.8 | 17 | 44 | 54,3753 | 142,3653 | 60 | 2 | 8 | RS | 50 | 0,5 | 5 |
| 13.8 | 9 | 40 | 53,3632 | 143,2142 | 162 | 3 | 9 | RS | 30 | 0,5 | 6 |
| 13.8 | 12 | 0 | 53,0762 | 143,3334 | 200 | 3 | 9 | RS | 30 | 0,5 | 6 |
| 13.8 | 12 | 15 | 53,0553 | 143,3187 | 180 | 2 | 3 | RS | 40 | 0,5 | 6 |
| 13.8 | 13 | 7 | 52,0002 | 143,3278 | 180 | 1 | 9 | RS | 30 | 0,5 | 6 |
| 13.8 | 13 | 37 | 52,9332 | 143,3484 | 168 | 2 | 5 | RS | 40 | 0,5 | 6 |
| 13.8 | 17 | 0 | 52,5057 | 143,3298 | 189 | 6 | 3 | RS | 50 | 0,5 | 6 |
| 14.8 | 14 | 4 | 52,0868 | 143,5011 | 90 | 1 | 9 | RS | 30 | 1 | 8 |
| 15.8 | 17 | 0 | 53,2889 | 143,2451 | 350 | 2 | 9 | RS | 40 | 0,5 | 2 |
| 16.8 | 13 | 0 | 52,7001 | 143,3625 | 180 | 1 | 9 | RS | 30 | 0,5 | 0,5 |
| 18.8 | 19 | 0 | 52,0832 | 143,5632 | 340 | 1 | 9 | RS | 50 | 1 | 10 |
| 20.8 | 13 | 0 | 53,5500 | 141,3833 | 210 | 1 | 3 | RS | 40 | 1 | 10 |
| 20.8 | 13 | 35 | 53,4915 | 141,4462 | 208 | 4 | 1 | RS | 70 | 1 | 10 |
| 25.8 | 18 | 45 | 53,3712 | 143,2387 | 300 | 1 | 2 | RS | 30 | 0 | 10 |
| 26.8 | 8 | 35 | 52,3745 | 143,5897 | 270 | 1 | 9 | RS | 40 | 1 | 10 |
| 26.8 | 14 | 15 | 52,1460 | 143,7667 | 330 | 1 | 9 | RS | 20 | 0 | 10 |
| 30.8 | 9 | 0 | 54,3452 | 142,5937 | 300 | 2 | 3 | RS | 20 | 0,5 | 5 |
| 31.8 | 12 | 30 | 53,4117 | 143,1916 | 190 | 2 | 9 | RS | 60 | 2 | 10 |
| 31.8 | 17 | 48 | 52,6511 | 143,3440 | 200 | 2 | 3 | RS | 40 | 3 | 10 |
| 3.9 | 10 | 0 | 52,9168 | 143,4446 | 60 | 1 | 9 | RS | 30 | 1 | 10 |
| 3.9 | 18 | 27 | 53,0919 | 143,3146 | 350 | 1 | 9 | RS | 70 | 2 | 10 |
| 4.9 | 12 | 26 | 53,2465 | 143,6030 | 170 | 1 | 3 | RS | 20 | 2 | 10 |
| 4.9 | 12 | 40 | 53,1863 | 143,6215 | 170 | 1 | 12 | RS | 40 | 1 | 10 |
| 12.9 | 14 | 55 | 53,2576 | 143,2663 | 170 | 2 | 3 | RS | 20 | 3 | 10 |
| 12.9 | 15 | 15 | 53,2033 | 143,2849 | 165 | 1 | 9 | RS | 30 | 2 | 10 |
| 16.9 | 16 | 40 | 52,4970 | 143,4952 | 247 | 1 | 11 | RS | 30 | 0,5 | 10 |
| 17.9 | 17 | 39 | 52,8662 | 143,4657 | 0 | 1 | 3 | RS | 60 | 3 | 10 |
| 18.9 | 14 | 0 | 53,1862 | 143,2927 | 10 | 1 | 10 | RS | 40 | 1 | 10 |
| 18.9 | 18 | 30 | 53,3481 | 143,2239 | 330 | 1 | 9 | RS | 30 | 1 | 10 |
| 18.9 | 19 | 10 | 53,2846 | 143,2521 | 170 | 1 | 12 | RS | 50 | 1 | 10 |
| 20.9 | 17 | 0 | 53,5057 | 141,4493 | 205 | 4 | 10 | RS | 40 | 3 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.9 | 17 | 12 | 53,4827 | 141,4298 | 205 | 2 | 10 | RS | 40 | 3 | 10 |
| 20.9 | 17 | 30 | 53,4634 | 141,4546 | 140 | 2 | 9 | RS | 40 | 3 | 10 |
| 20.9 | 18 | 0 | 53,4376 | 141,5093 | 130 | 4 | 9 | RS | 20 | 3 | 10 |
| 21.9 | 9 | 0 | 53,3826 | 141,4234 | 136 | 2 | 3 | RS | 30 | 2 | 10 |
| 21.9 | 10 | 0 | 53,3907 | 141,5991 | 140 | 2 | 9 | RS | 40 | 2 | 10 |
| 21.9 | 15 | 25 | 53,3738 | 141,6684 | 130 | 3 | 9 | RS | 70 | 2 | 10 |
| 21.9 | 16 | 0 | 53,3226 | 141,7367 | 160 | 1 | 3 | RS | 20 | 2 | 10 |
| 21.9 | 16 | 30 | 53,2780 | 141,7738 | 177 | 2 | 11 | RS | 30 | 2 | 10 |
| 22.9 | 9 | 0 | 53,2044 | 141,7699 | 210 | 2 | 9 | RS | 60 | 3 | 10 |
| Largha (Spotted) Seal | | | | | | | | | | | |
| 25.7 | 15 | 0 | 49,0500 | 144,6333 | 343 | 4 | 4 | SS | 70 | 0 | 10 |
| 25.7 | 16 | 0 | 49,2062 | 144,5817 | 348 | 2 | 6 | SS | 100 | 0 | 10 |
| 26.7 | 8 | 40 | 51,7761 | 143,4369 | 222 | 1 | 11 | SS | 40 | 1 | 0,2 |
| 26.7 | 9 | 45 | 51,7521 | 143,3300 | 269 | 4 | 9 | SS | 70 | 1 | 2 |
| 26.7 | 17 | 0 | 52,5167 | 143,3500 | 10 | 2 | 9 | SS | 10 | 2 | 0,2 |
| 28.7 | 14 | 16 | 53,3184 | 143,2709 | 55 | 2 | 8 | SS | 30 | 4 | 0,5 |
| 31.7 | 15 | 10 | 53,2037 | 143,3187 | 173 | 1 | 11 | SS | 30 | 1 | 0,1 |
| 31.7 | 17 | 40 | 52,8053 | 143,3876 | 172 | 1 | 9 | SS | 50 | 3 | 0,3 |
| 5.8 | 11 | 0 | 52,9074 | 143,3373 | 200 | 1 | 5 | SS | 30 | 0,5 | 0,1 |
| 5.8 | 16 | 35 | 52,4457 | 143,3802 | 167 | 1 | 12 | SS | 50 | 0,5 | 2 |
| 8.8 | 11 | 17 | 52,0883 | 143,5463 | 270 | 2 | 9 | SS | 70 | 1 | 10 |
| 11.8 | 18 | 0 | 54,2167 | 142,3500 | 330 | 1 | 7 | SS | 20 | 2 | 2 |
| 13.8 | 8 | 20 | 53,4550 | 143,1916 | 180 | 1 | 9 | SS | 70 | 1 | 8 |
| 13.8 | 15 | 30 | 52,7217 | 143,3514 | 184 | 1 | 3 | SS | 70 | 0,5 | 8 |
| 13.8 | 16 | 26 | 52,5866 | 143,3451 | 188 | 1 | 5 | SS | 100 | 0,5 | 6 |
| 19.8 | 12 | 0 | 53,4427 | 143,1972 | 160 | 1 | 9 | SS | 30 | 3 | 10 |
| 24.8 | 15 | 20 | 53,0971 | 143,3635 | 120 | 1 | 9 | SS | 40 | 3 | 10 |
| 25.8 | 13 | 34 | 53,1028 | 143,3279 | 330 | 2 | 9 | SS | 40 | 0 | 10 |
| 30.8 | 9 | 0 | 54,3452 | 142,5937 | 300 | 1 | 9 | SS | 50 | 0,5 | 5 |
| 12.9 | 18 | 47 | 52,8108 | 143,3675 | 180 | 4 | 3 | SS | 70 | 1 | 10 |
| 15.9 | 16 | 30 | 54,1072 | 142,4497 | 350 | 1 | 1 | SS | 20 | 1 | 10 |
| 20.9 | 17 | 30 | 53,4634 | 141,4546 | 140 | 1 | 12 | SS | 50 | 3 | 10 |
| Bearded Seal | | | | | | | | | | | |
| 28.7 | 17 | 0 | 53,3833 | 143,1833 | 63 | 1 | 6 | BS | 30 | 3 | 0,4 |
| 15.8 | 11 | 40 | 52,8171 | 143,4157 | 20 | 1 | 9 | BS | 20 | 0,5 | 2 |
| 20.8 | 14 | 0 | 53,4555 | 141,4777 | 130 | 1 | 9 | BS | 30 | 1 | 10 |
| 20.8 | 15 | 13 | 53,3333 | 141,7167 | 165 | 1 | 3 | BS | 100 | 2 | 10 |
| 24.8 | 15 | 0 | 53,1312 | 143,3911 | 180 | 1 | 3 | BS | 60 | 2 | 10 |
| 25.8 | 19 | 40 | 53,4821 | 143,1589 | 300 | 2 | 9 | BS | 20 | 0 | 10 |
| 26.8 | 10 | 24 | 52,2677 | 143,7504 | 180 | 1 | 5 | BS | 60 | 0,5 | 99 |
| 16.9 | 17 | 7 | 52,4622 | 143,3913 | 247 | 1 | 11 | BS | 30 | 0,5 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.9 | 17 | 12 | 53,4827 | 141,4298 | 205 | 1 | 10 | BS | 50 | 3 | 10 |
| 20.9 | 17 | 30 | 53,4634 | 141,4546 | 140 | 1 | 9 | BS | 100 | 3 | 10 |
| 21.9 | 15 | 25 | 53,3738 | 141,6684 | 130 | 2 | 3 | BS | 50 | 2 | 10 |
| 21.9 | 16 | 0 | 53,3226 | 141,7367 | 160 | 2 | 9 | BS | 60 | 2 | 10 |
| 22.9 | 9 | 50 | 53,0964 | 141,6708 | 210 | 3 | 3 | BS | 40 | 2 | 10 |
| Unidentified Seal Species | | | | | | | | | | | |
| 31.7 | 17 | 0 | 52,9127 | 143,3649 | 173 | 2 | | US | 70 | 2 | 0,2 |
| 5.8 | 10 | 20 | 52,9187 | 143,4200 | 260 | 2 | 3 | US | 80 | 0,5 | 0,1 |
| 5.8 | 14 | 0 | 52,8354 | 143,3725 | 185 | 1 | 9 | US | 70 | 0,5 | 0,5 |
| 5.8 | 14 | 30 | 52,7404 | 143,3581 | 160 | 1 | 3 | US | 70 | 0,5 | 0,2 |
| 5.8 | 15 | 0 | 52,6820 | 143,3536 | 184 | 1 | 2 | US | 70 | 0,5 | 1 |
| 5.8 | 15 | 50 | 52,5509 | 143,3485 | 181 | 1 | 4 | US | 80 | 0,5 | 2 |
| 5.8 | 16 | 0 | 52,5152 | 143,3492 | 180 | 5 | 3 | US | 70 | 0,5 | 2 |
| 5.8 | 16 | 20 | 52,4779 | 143,3630 | 165 | 7 | 8 | US | 70 | 0,5 | 2 |
| 13.8 | 10 | 0 | 53,3209 | 143,2334 | 172 | 3 | 3 | US | 70 | 0,5 | 6 |
| 13.8 | 10 | 13 | 53,2877 | 143,2482 | 169 | 1 | 9 | US | 100 | 0,5 | 6 |
| 13.8 | 10 | 40 | 53,2217 | 143,2745 | 171 | 6 | 3 | US | 100 | 0,5 | 6 |
| 13.8 | 11 | 0 | 53,1805 | 143,2884 | 176 | 3 | 3 | US | 150 | 0,5 | 8 |
| 13.8 | 17 | 20 | 52,4667 | 143,3204 | 203 | 4 | 10 | US | 150 | 0,5 | 8 |
| 3.9 | 17 | 35 | 52,9654 | 143,3709 | 350 | 1 | 9 | US | 100 | 2 | 10 |
| 4.9 | 12 | 21 | 53,2469 | 143,5980 | 170 | 1 | 3 | US | 80 | 2 | 10 |
| 15.9 | 12 | 0 | 54,1072 | 142,4498 | 130 | 2 | 3 | US | 50 | 2 | 6 |
| Northern Fur Seal | | | | | | | | | | | |
| 24.7 | 7 | 14 | 45,7399 | 142,2494 | 86 | 1 | 7 | NF | 20 | 0,5 | 0,1 |
| 24.7 | 9 | 42 | 45,8071 | 142,8554 | 79 | 1 | 6 | NF | 200 | 0,5 | 8 |
| 24.7 | 9 | 55 | 45,8145 | 142,9069 | 81 | 2 | 9 | NF | 100 | 0 | 6 |
| 25.7 | 7 | 20 | 48,6802 | 144,8662 | 272 | 4 | 4 | NF | 100 | 1 | 10 |
| 25.7 | 7 | 20 | 48,6802 | 144,8662 | 272 | 3 | 9 | NF | 50 | 1 | 10 |
| 25.7 | 7 | 20 | 48,6802 | 144,8662 | 272 | 4 | 10 | NF | 50 | 1 | 10 |
| 25.7 | 7 | 45 | 48,6863 | 144,7663 | 0 | 3 | 10 | NF | 75 | 1 | 10 |
| 25.7 | 8 | 0 | 48,7207 | 144,7458 | 0 | 7 | 8 | NF | 100 | 1 | 10 |
| 25.7 | 8 | 7 | 48,7380 | 144,7456 | 90 | 3 | 9 | NF | 30 | 1 | 10 |
| 25.7 | 8 | 16 | 48,7397 | 144,7760 | 90 | 4 | 3 | NF | 50 | 0,5 | 8 |
| 25.7 | 8 | 21 | 48,7398 | 144,7975 | 90 | 2 | 9 | NF | 75 | 0,5 | 6 |
| 25.7 | 8 | 30 | 48,7390 | 144,8328 | 90 | 8 | 3 | NF | 150 | 0,5 | 6 |
| 25.7 | 8 | 43 | 48,7354 | 144,8863 | 90 | 3 | 3 | NF | 50 | 0,5 | 10 |
| 25.7 | 8 | 55 | 48,7317 | 144,9388 | 90 | 5 | 9 | NF | 20 | 0,5 | 10 |
| 25.7 | 9 | 0 | 48,7320 | 144,9612 | 90 | 4 | 9 | NF | 70 | 0,5 | 6 |
| 25.7 | 9 | 12 | 48,7351 | 145,0017 | 90 | 7 | 3 | NF | 100 | 0,5 | 6 |
| 25.7 | 9 | 20 | 48,7565 | 145,0035 | 0 | 8 | 3 | NF | 30 | 0,5 | 10 |
| 25.7 | 9 | 34 | 48,7890 | 145,0008 | 0 | 9 | 9 | NF | 50 | 0,5 | 10 |
| 25.7 | 9 | 45 | 48,7930 | 144,9500 | 270 | 14 | 9 | NF | 100 | 0,5 | 10 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 25.7 | 10 | 0 | 48,7914 | 144,9084 | 270 | 12 | 9 | NF | 70 | 0,5 | 10 |
| 25.7 | 11 | 0 | 48,8333 | 144,7510 | 90 | 4 | 10 | NF | 100 | 0,5 | 10 |
| 25.7 | 11 | 30 | 48,8334 | 144,8677 | 302 | 6 | 9 | NF | 200 | 0,5 | 10 |
| 25.7 | 14 | 37 | 48,9833 | 144,6500 | 343 | 4 | 5 | NF | 70 | 0 | 10 |
| 13.8 | 7 | 0 | 53,4884 | 143,1984 | 200 | 1 | 6 | NF | 50 | 1 | 10 |
| Sea Lion | | | | | | | | | | | |
| 24.7 | 7 | 12 | 45,7369 | 142,2492 | 85 | 2 | 3 | SL | 500.5 | 0.1 | |
| 25.7 | 7 | 45 | 48,6863 | 144,7663 | 0 | 1 | 4 | SL | 20 | 1 | 10 |
| 6.8 | 8 | 0 | 52,4139 | 143,3932 | 182 | 1 | 6 | SL | 50 | 0,5 | 0,2 |
| 12.8 | 18 | 46 | 54,4376 | 142,6315 | 63 | 1 | 8 | SL | 70 | 1 | 5 |
| 19.8 | 15 | 0 | 53,4428 | 143,1969 | 160 | 1 | 3 | SL | 30 | 3 | 4 |
| 21.9 | 10 | 0 | 53,3907 | 141,5991 | 140 | 1 | 12 | SL | 80 | 2 | 10 |
| 24.9 | 7 | 50 | 50,1012 | 140,7668 | 185 | 1 | 4 | SL | 70 | 2 | 10 |

Appendix 2. Number of gray whale sightings recorded during daily research activities aboard the *Nevelskoy*, 2003.

| Date | Area | Activity | Number of Gray Whale Sightings | Total Number of Individual Gray Whales[1] |
|---|---|---|---|---|
| 22-Jul | Vladivostok | Traveling to study area | 0 | 0 |
| 25-Jul | Terpenie Point | Traveling to study area | 0 | 0 |
| 26-Jul | Kaigoun | Traveling to study area | 0 | 0 |
| 27-Jul | | Traveling to study area | 0 | 0 |
| 28-Jul | Piltun | Prey Sampling | 0 | 0 |
| 29-Jul | Piltun | Acoustics, Prey Sampling | 1 | 1 |
| 30-Jul | Piltun | Acoustics, Prey Sampling | | |
| 31-Jul | Chayvo | Acoustics | 0 | 0 |
| 01-Aug | Chayvo | Acoustics | 0 | 0 |
| 02-Aug | Piltun | Prey Sampling | 8 | 13 |
| 03-Aug | Piltun | Prey Sampling | 0 | 0 |
| 04-Aug | PA-B, Orlan | Acoustics | 0 | 0 |
| 05-Aug | PA-B, Orlan | Acoustics | 1 | 1 |
| 06-Aug | Chayvo, Offshore | Acoustics, Prey Sampling | 5 | 12 |
| 07-Aug | Offshore | Photo-ID | 14 | 24 |
| 08-Aug | Offshore | **Partial Vessel Survey** | 26 | 47 |
| 09-Aug | Piltun | **Partial Vessel Survey** | 3 | 7 |
| 10-Aug | Sakhalin Bay | Storm | 0 | 0 |
| 11-Aug | Sakhalin Bay | Storm | 0 | 0 |
| 12-Aug | Sakhalin Bay | Storm | 0 | 0 |
| 13-Aug | Piltun | **Full Vessel Survey,** Acoustics, Photo-ID | 21 | 32 |
| 14-Aug | Offshore | **Full Vessel Survey,** Acoustics | 27 | 48 |
| 15-Aug | Piltun | **Full Vessel Survey** | 23 | 40 |

| Date | Area | Activity | Number of Gray Whale Sightings | Total Number of Individual Gray Whales[1] |
|---|---|---|---|---|
| 16-Aug | Piltun, Offshore | Prey Sampling, Acoustics | 0 | 0 |
| 17-Aug | Offshore | Prey Sampling | fog | fog |
| 18-Aug | Offshore | Prey Sampling, Photo-ID | 9 | 19 |
| 19-Aug | Piltun | Acoustics | 0 | 0 |
| 20-Aug | Sakhalin Bay | Storm | 0 | 0 |
| 21-Aug | Nikolaevsk | Refuelling, resupplying | 0 | 0 |
| 22-Aug | Nikolaevsk | Storm | 0 | 0 |
| 23-Aug | Nikolaevsk | Storm | 2 | 3 |
| 24-Aug | Piltun | Photo-ID | 24 | 46 |
| 25-Aug | Piltun | **Full Vessel Survey,** Photo-ID | 22 | 42 |
| 26-Aug | Offshore | **Full Vessel Survey,** Prey Sampling, Photo-ID | 10 | 23 |
| 27-Aug | Offshore | Prey Sampling, Photo-ID | 10 | 17 |
| 28-Aug | Offshore | Prey Sampling, Photo-ID | 14 | 31 |
| 29-Aug | Offshore | Storm | 0 | 0 |
| 30-Aug | Cape Elizaveta | Storm | 0 | 0 |
| 31-Aug | Piltun | **Vessel Survey** | 35 | 47 |
| 01-Sep | Piltun | **Vessel Survey**, Acoustics | 28 | 45 |
| 02-Sep | Piltun | Acoustics, Photo-ID | 7 | 11 |
| 03-Sep | Piltun | Prey Sampling, Acoustics, Photo-ID | 12 | 17 |
| 04-Sep | Piltun | Acoustics, Photo-ID | 8 | 16 |

| Date | Area | Activity | Number of Gray Whale Sightings | Total Number of Individual Gray Whales[1] |
|---|---|---|---|---|
| 05-Sep | Offshore | Prey Sampling, Acoustics, Photo-ID | 11 | 16 |
| 06-Sep | Offshore | Prey Sampling, Acoustics, Photo-ID | 11 | 15 |
| 07-Sep | Offshore | Prey Sampling, Photo-ID | 17 | 30 |
| 08-Sep | Offshore | Prey Sampling, Photo-ID | 12 | 15 |
| 09-Sep | Offshore | Prey Sampling, Acoustics, Photo-ID | 4 | 6 |
| 10-Sep | Offshore | Prey Sampling, Photo-ID | 4 | 5 |
| 11-Sep | Cape Elizaveta | Storm | 0 | 0 |
| 12-Sep | Piltun | **Full Vessel Survey**, Acoustics | 31 | 41 |
| 13-Sep | Offshore | Prey Sampling, Photo-ID | 18 | 30 |
| 14-Sep | Levenshtern Point | Storm | 0 | 0 |
| 15-Sep | Maria Point | Storm | 0 | 0 |
| 16-Sep | Piltun | Prey Sampling, Acoustics | 0 | 0 |
| 17-Sep | Piltun | Acoustics | 2 | 2 |
| 18-Sep | Piltun | Prey Sampling, Acoustics, Photo-ID | 16 | 22 |
| 19-Sep | Piltun | Prey Sampling, Acoustics, Photo-ID | 18 | 24 |
| 20-Sep | Elizaveta Point | Traveling to Vladivostok | 0 | 0 |
| 21-Sep | Nikolaevsk-on-Amur | Traveling to Vladivostok | 0 | 0 |
| 22-Sep | Nikolaevsk-on-Amur | Traveling to Vladivostok | 0 | 0 |
| 23-Sep | Tatarsky Strait | Traveling to Vladivostok | 0 | 0 |
| 24-Sep | Tatarsky Strait | Traveling to Vladivostok | 0 | 0 |
| 25-Sep | | Traveling to Vladivostok | 0 | 0 |
| 26-Sep | Tetukhe | Traveling to Vladivostok | 0 | 0 |
| 27-Sep | Vladivostok | Expedition Complete | 0 | 0 |

[1]Number of individuals presented here not confirmed with photo-identification methods. Individual whales may have been counted multiple times.